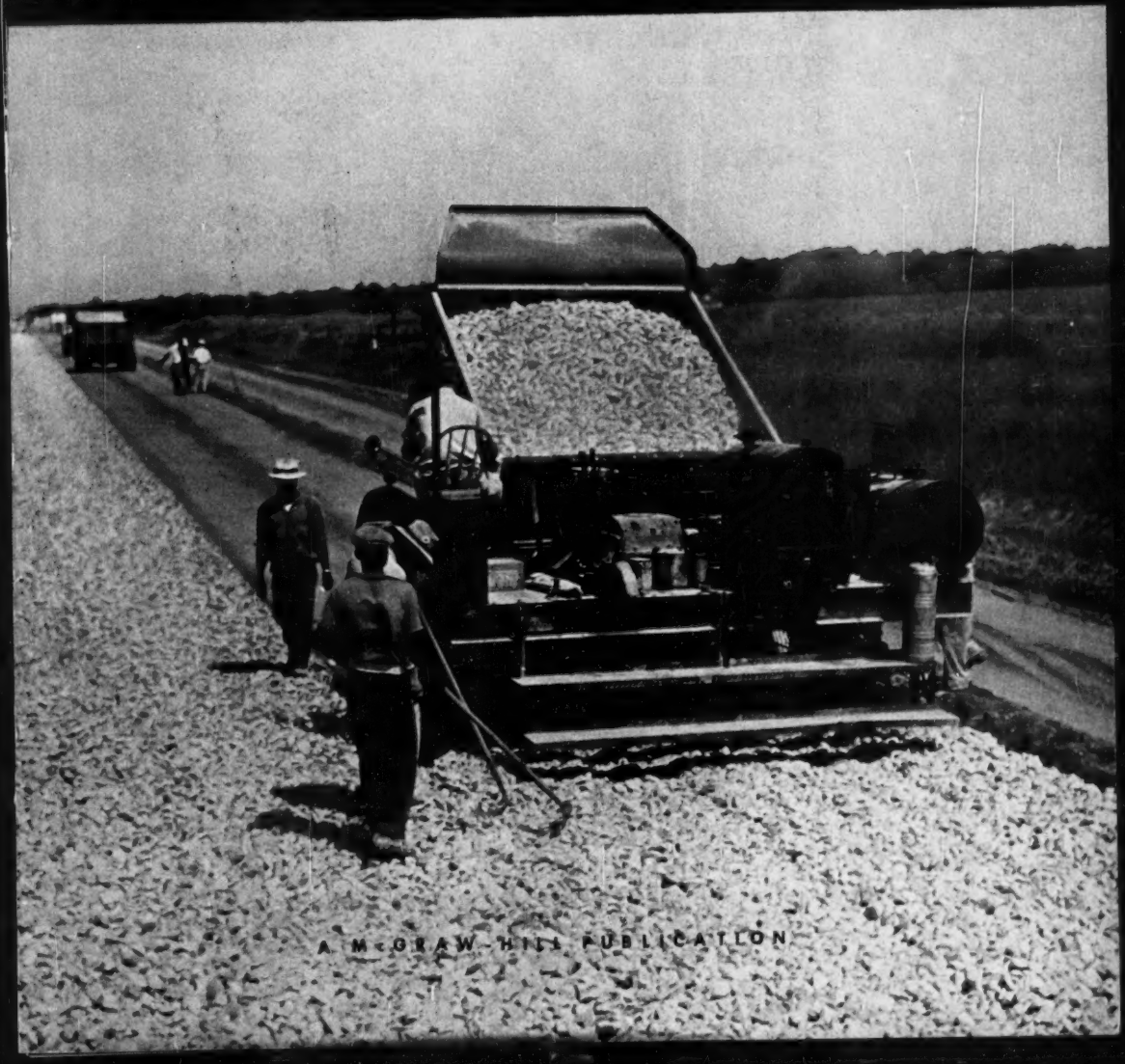
CONSTRUCTION
METHODS AND EQUIPMENT

January 1952



A McGRAW-HILL PUBLICATION

You're looking at the dam from the cableway operator's control station. The track cable extends from the head tower 2420 feet across the river canyon to the tail tower (upper circle). The 8-yard bucket (lower circle) is loaded at a dock beneath the control station. G-E amplidyne control provides fast operation and flexibility, needs only minimum maintenance.

WORLD'S FASTEST CABLEWAY speeds dam construction . . . electrically!

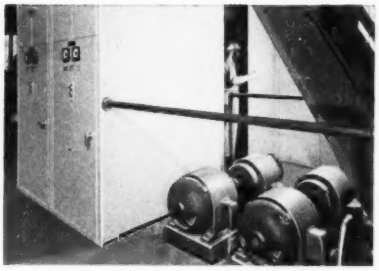
G-E powered rig at Pine Flat Dam hoists and hauls at same time; has poured 4000 yards in single day!

At Pine Flat Dam on the Kings River near Fresno, California, the General Electric powered cableway—fastest in the world—is setting new pouring records to help build the world's ninth highest dam. A Corps of Engineers project, the dam is being built by Pine Flat Contractors Associated Companies.

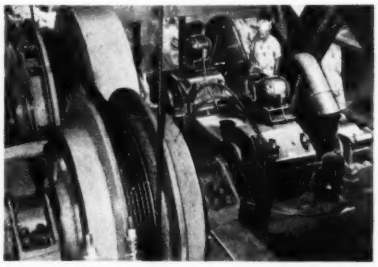
The Pine Flat rig, built by Willamette Iron and Steel Co., is the first ever designed with G-E amplidyne control—for faster acceleration, greater precision, smoother operation. In addition, a new concept of power application permits hoisting and hauling at the same time. Automatic braking makes operation safer. Smoother acceleration lessens wear on cables and other equipment. And power losses during acceleration and deceleration are reduced.

For faster, safer, easier operation of *your* construction equipment, electrify with G-E drives and power distribution systems—backed by G-E engineering help in application, installation, and service. *General Electric Co., Schenectady 5, N. Y.*

Ask him today! **Whether you buy or build construction equipment, your G-E representative can show you how to do a better job—at lower cost—by complete electrification. Write him now, and he'll call on you at your convenience.**



Key to rig's speed—G-E amplidynes in head tower for hoist and haul drives provide smooth adjustable voltage control by limiting current during acceleration.



Carriage drive motors are built by G.E. for extra-tough applications like this. The completely separate two-motor hoist drive is also located in the head tower.

GENERAL ELECTRIC

664-20

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

These B. F. Goodrich conveyor belts are lasting 3 times as long

THE big Euclid Loader shown above is one of several on the Garrison Dam project. B. F. Goodrich conveyor belts on these loaders have outlasted by more than 3 times the life that would be expected of ordinary belts. And this record is still growing because *many of the belts are still on the job.* Here is why BFG conveyor belts can be counted on for extra service:

Greater flexibility — The square-edge construction, found only in B. F. Goodrich belts, insures greater flexibility, helps the belt travel more easily, with less strain, less wear. This is because each layer of top and bottom ply fabric runs only from one edge of the belt to the other. There's no folding over of a ply to make it serve as part of the next fabric layer. Edges are bonded, won't separate. Belt troughs perfectly whether loaded or empty.

All fibers put to work — Uniform tension is maintained throughout every step of building BFG belts. In completed belt, all lengthwise fibers work together; none "go along for the ride."

Special rubber used — Chemicals developed by B. F. Goodrich are added to the rubber to resist the effects of age. These special chemicals keep the rubber "live" and elastic. Not affected by sun and weather.

These are some of the reasons B. F. Goodrich can furnish a belt like the one in the picture — one that far outlasts other medium-priced belts, one that makes a record for savings, one that can cut the costs of hundreds of industrial operations. Your local B. F. Goodrich distributor will show you how a BFG belt can save you money. Or write *The B. F. Goodrich Company, Industrial & General Products Division, Akron, Ohio.*

Conveyor Belts BY
B.F.Goodrich
RUBBER FOR INDUSTRY

Announcing

THE V. A. O. BLASTING METER

manufactured by Roller-Smith Company, Bethlehem, Pennsylvania

A combination voltmeter, ammeter, and blasting galvanometer for practical field use

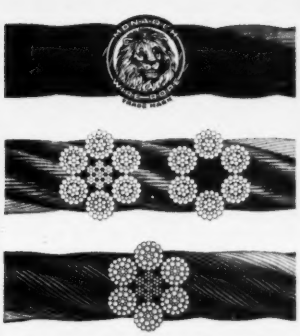
The V. A. O. (volts-amperes-ohms) Blasting Meter, embodying design features suggested by Hercules explosives engineers, marks a major development in the field of blasting instruments. Important features of the V. A. O. Blasting Meter are:

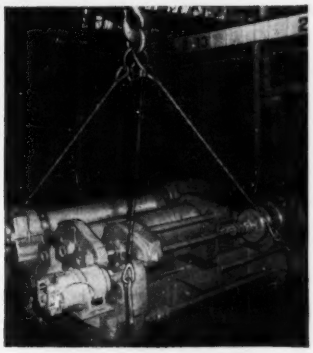
1. It contains the necessary electrical components, adjusted to specific ranges, for checking stray currents and voltages around blasting operations.
2. It is equipped with a rectifier and, therefore, can be used for detecting either alternating or direct current and voltages.
3. It can be used as a blasting galvanometer for checking the circuit of individual electric detonators or detonators connected in series.

See booklet, which will be furnished on request, describing the V. A. O. Blasting Meter and giving instructions regarding its use. This instrument is now available through Hercules representatives.

HERCULES POWDER COMPANY Explosives Department, 974 Market St., Wilmington, Delaware

MACWHYTE





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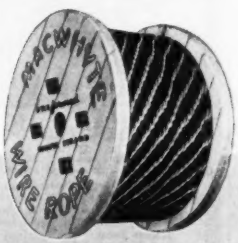

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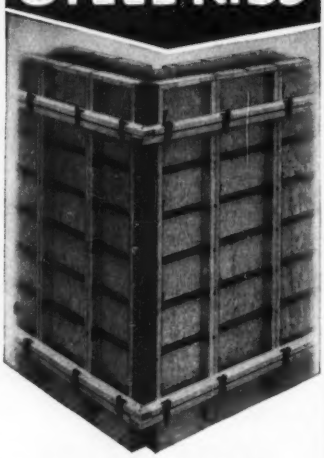

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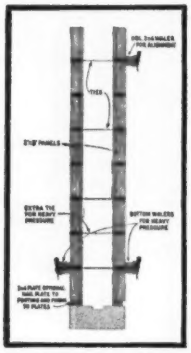

Try these forms on a rental basis. Rental charges apply on the purchase price.

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CONSTRUCTION METHODS AND EQUIPMENT

Volume 34, Number 1 **JANUARY 1952** Established 1919

Pay Dirt in This Issue

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Ramps from shore to river pier sites are working bases for cranes; concrete is ferried across from single plant.

Raised Pumpcrete Discharge Paves 40-Ft Swath of Floor 52
Jumbo carries elevated pipe and swing chute to distribute pumped mix over wide area of 21-acre slab

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Insulated panels, cast in mass production and joined by welding, save time and money on 1,000 dwelling units

Norway Mixes Highway Concrete Right on the Subgrade 66
Train of self-propelled machines rides road forms to mix mortar and stone into stronger, cheaper concrete

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Robert K. Tomlin was appointed editor of CONSTRUCTION METHODS in January 1928, was succeeded by Waldo G. Bowman in January 1946, and by Harold W. Richardson in February 1949.

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Gotham Cheers!

10 DAYS SAVED IN REPAVING KEY SECTIONS OF HENRY HUDSON PARKWAY

● Repaving this key section of Henry Hudson Parkway's northbound lane illustrates how good job planning minimizes traffic interference. Using 'INCOR' AIR-ENTRAINING 24-HOUR CEMENT for the dual advantage of increased workability and durability, plus dependable 24-hour service strength, heavy traffic was maintained through the job at all times. And the handsome new 'Incor' roadway was in full use ten days ahead of schedule! Good example of modern efficiency in highway building and ready-mix service, as well as of this clear-cut fact:

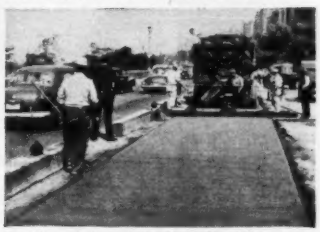
When you want to beat a record, without sacrificing quality, you can't beat 'Incor'*, America's FIRST High-early-strength Air-entraining Portland Cement.

*Reg. U. S. Pat. Off.

ANOTHER EXAMPLE OF DUAL ADVANTAGE OF 'INCOR' AIR-ENTRAINING 24-HOUR CEMENT

Traffic used 3 lanes, while 2" asphalt topping and 3" of old concrete base were dug out and two westerly lanes concreted.

All hands remarked at the cohesive, highly-plastic quality of the 3½" slump 'Incor' air-entrained concrete.



Finishing followed closely behind the mixer —highly-plastic 'Incor' mix expedited placing and finishing.

The first two lanes were quickly opened to traffic, as work went ahead at top speed on the next two lanes.

Completed 10 days ahead of time—result of paving know-how, on-time ready-mix service, and typical 'Incor' performance.

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No body-hoist

GRAVITY DUMP cuts maintenance costs... speeds haul cycles

Koehring Dumptors have no slow-working body hoists. Trip the release lever and gravity dumps the 6-yard load in one second. It's as simple as that! No complicated mechanical hoists to slow up haul cycles . . . no expensive replacement parts, costly hoist maintenance or down time to eat into your profits. And gravity dump is instantaneous and trouble-free in all temperature extremes . . . never wears out.

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Check your body hoist and spring maintenance costs for a year . . . see how much you'll save by using Dumptors. What's more, Dumptor's no-turn shuttle haul and constant-mesh transmission for 3-speed travel forward and reverse, increases production . . . and your profits. See your Koehring distributor now for all the facts . . . or send today for informative 28-page Dumptor catalog.

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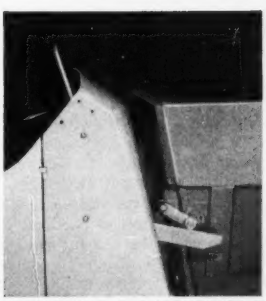

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3 Body rolls on heavy-duty rockers. Snub chains attached to big coil-spring shock-absorbers check body at 70-degree tilt.

where

B.F.Goodrich

Off-the-road tires give general contractor better over-all service, more recaps

MAURICE HENDRICKSON (above) examines the tires on a low-bed trailer used for carrying 50 to 60 tons of heavy-duty equipment. As Motor Vehicle Supervisor for Hendrickson Bros., Inc., general contractors of Valley Stream, N. Y., it's his job to see that the tires on this company's excavating, grading and heavy construction equipment give good service and can take the rough treatment of off-the-road service.

"We have been using B.F.Goodrich tires for years," Mr. Hendrickson says, "and have found they give us better over-all service than other similar types of tires, better traction and a minimum of service trouble." And he adds: "We particularly like the greater number of B. F. Goodrich tires suitable for recapping."

Mr. Hendrickson's experience is typical of that of off-the-road operators throughout the country. They report B. F. Goodrich tires, built with the exclusive nylon shock shield, give excellent service and more recaps under the toughest operating conditions. The strong, elastic nylon cords under the tread rubber stretch together under impact, actually protect the tire body from smashing road shock. This means BFG tires wear longer, give you a 4-way saving:

(1) increased tire mileage (2) greater resistance to bruising (3) less danger of tread separation (4) more recappable tires.

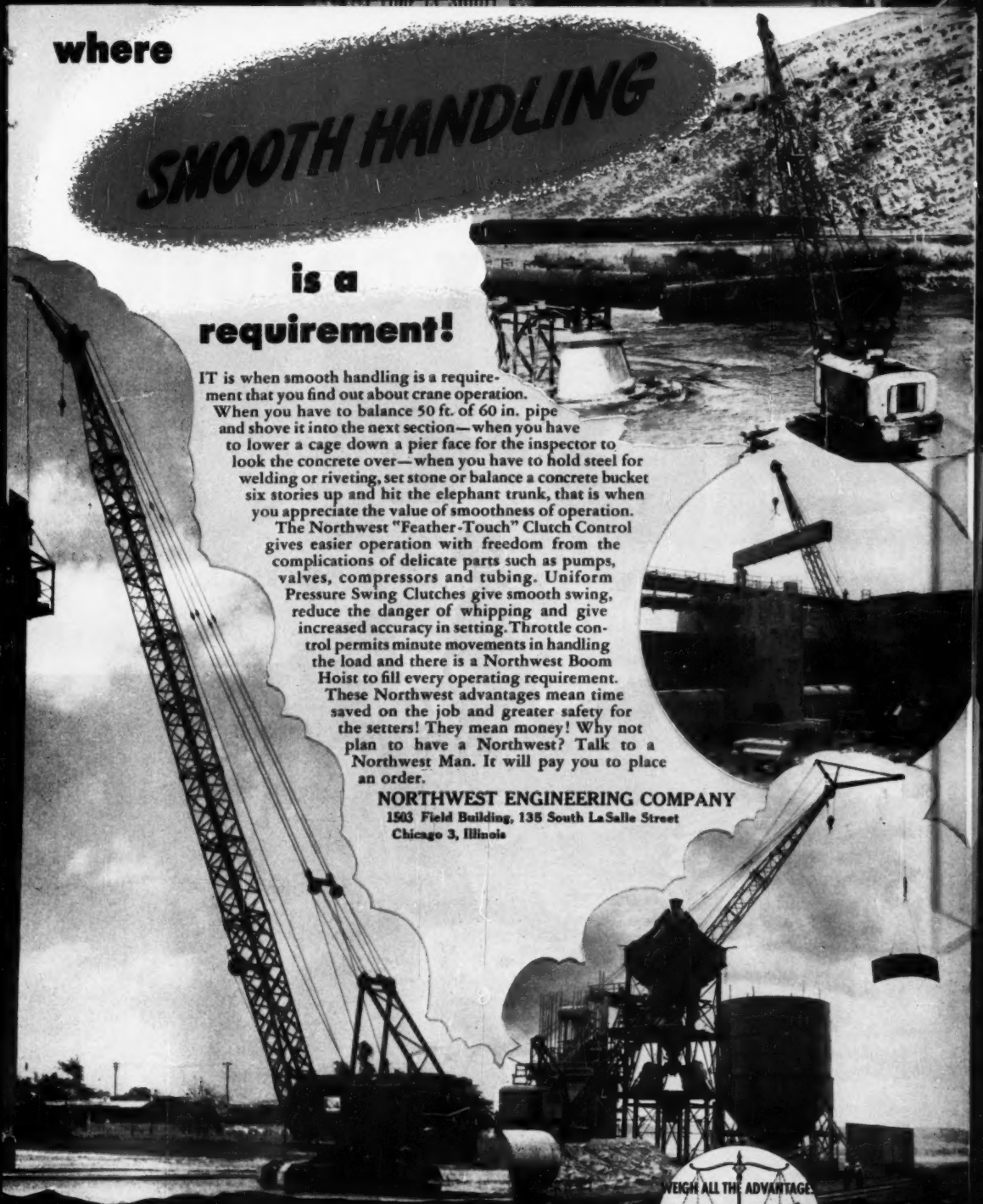
Whatever your off-the-road job, there's a BFG tire designed to do it better and save you money. Hendrickson Bros., Inc., for example, uses B. F. Goodrich Rock Logger, Universal and Highway Express tires, depending on the job to be done. See your local dealer for the full story or write *The B. F. Goodrich Co., Akron, Ohio.*

where

SMOOTH HANDLING

is a

requirement!



IT is when smooth handling is a requirement that you find out about crane operation. When you have to balance 50 ft. of 60 in. pipe and shove it into the next section—when you have to lower a cage down a pier face for the inspector to look the concrete over—when you have to hold steel for welding or riveting, set stone or balance a concrete bucket six stories up and hit the elephant trunk, that is when you appreciate the value of smoothness of operation.

The Northwest "Feather-Touch" Clutch Control gives easier operation with freedom from the complications of delicate parts such as pumps, valves, compressors and tubing. Uniform Pressure Swing Clutches give smooth swing, reduce the danger of whipping and give increased accuracy in setting. Throttle control permits minute movements in handling the load and there is a Northwest Boom Hoist to fill every operating requirement.

These Northwest advantages mean time saved on the job and greater safety for the setters! They mean money! Why not plan to have a Northwest? Talk to a Northwest Man. It will pay you to place an order.

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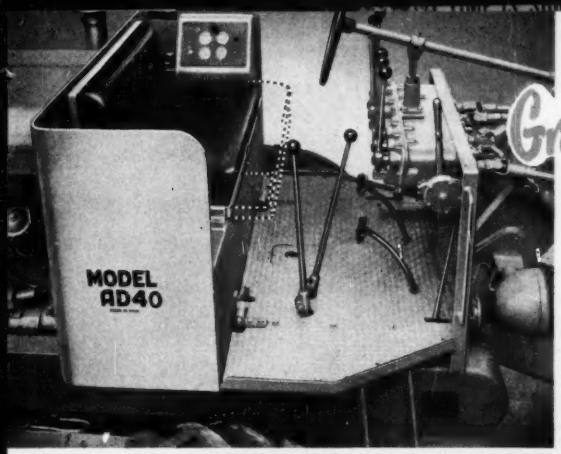
Weight — 23,000 lb.
(24,800 lb. with optional calcium chloride in tires)

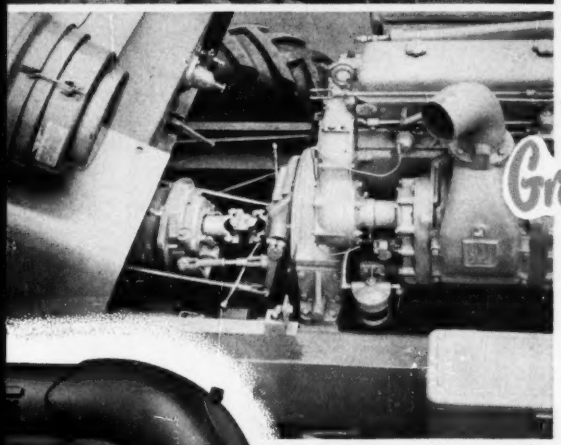
104 Brake hp.

Built to handle All Jobs — FASTER, EASIER



Great New operating ease

No other grader has been designed with the operator more in mind. **Unmatched Visibility**—Single tubular frame from front to platform, new lift cases, low control box and tapered platform give operator a full view of what he is doing. **Feather-Touch Steering**—New hydraulic booster system, fully enclosed in the frame, provides effortless steering with positive control even under toughest conditions. **All-Around Comfort**—Roomy platform, adjustable seat (as shown) and simple controls offer any size operator true comfort—sitting or standing.



Great New service simplicity

Here's maintenance and repair accessibility second to none. Combined fuel tank and seat unit tilts forward for easy access to clutch, transmission and drive shaft. Transmission can be removed without disturbing floor plates. Power take-off and hydraulic pump are mounted outside the dash.

Great New performance

Add these outstanding operator and service advantages to the exclusive Allis-Chalmers features that include ROLL-AWAY* Moldboard—extra high clearances from front to rear—shock-absorbing tubular frame—dependable General Motors 2-Cycle diesel power . . . and you have the finest heavy-duty grader on the market. Get the full story on this new AD-40 from your Allis-Chalmers dealer now.

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On a wide range of jobs and under the toughest conditions, "Eucs" move more loads or tons per hour at the lowest cost. Large capacity, long life in heavy duty service, and speed on the haul and dump—these are features that assure low cost hauling and dependable performance.

Bottom-Dump Euclids have proved their rugged staying power and ability to do the toughest jobs in off-the-highway construction and industrial work. Powered by diesel engines of 190 to 300 h.p., they range in capacity from 13 to 25 cu. yds., and have top speeds loaded up to 34.4 m.p.h.

Rear-Dump "Eucs" are designed and built to move rock, coal, ore, overburden and other heavy excavation. They range in capacity from 10 to 34 tons, have top speeds up to 36.3 m.p.h. with full payload, and diesel engines of 125 to 400 h.p.

For help with your off-the-highway hauling problems, call your Euclid Distributor today or write for information on the complete line of Euclid equipment for moving earth, rock, coal and ore.

"EUCS" are job proved for more loads per hour and more profit per load.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

CABLE ADDRESS: YUKLID CODE: BENTLEY

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FASTER AND HIGHER

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Today–See the new MARLOWS

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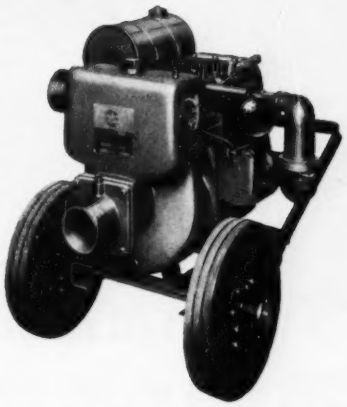

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Catalog Sent Promptly

MARLOWS LAST INDEFINITELY!

A Marlow is the only self-priming centrifugal pump made with a replaceable impeller and diffuser. After long hard use, they can be easily and inexpensively replaced with new ones to restore the pump to full original efficiency.

MARLOW - EVERYWHERE!

Marlow pumps are sold and serviced by leading contractors' equipment distributors in 48 states and principal foreign countries. Backed by the Marlow organization — the largest of its kind.

MARLOW PUMPS

RIDGEWOOD NEW JERSEY

Manufacturers of the World's Largest Line of Contractors' Pumps

Including the Famous Marlow Mud Hogs

The Gradall works easily in many a tight spot!

WHEN YOUR CONSTRUCTION WORK must be done in "tight" places such as this, there's one machine you can count on to do the job quickly—the Gradall.

Its "arm-action" boom actually reaches out, twists and turns, to do its work in areas very little larger than the machine itself. And the Gradall's powerful hydraulic "down pressure" and exacting tool control make it easy to dig excavations to blueprint specifications—with clean-cut vertical or sloping sides, precise square corners, and perfectly graded floors. It practically eliminates costly hand labor.

But take your own construction problems to your nearest Gradall Distributor. He'll be glad to show you how this versatile machine can cut costs for you, too.

Gradall—the multi-purpose construction machine *with controlled down pressure*

Gradall®

DIVISION OF WARNER & SWASEY Cleveland

Gradall Distributors in over 60 principal cities in the United States and Canada

TEAMWORK IN SPECIALTIES

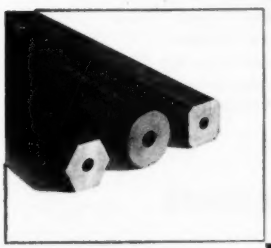
the drill runner...

CRUCIBLE HOLLOW DRILL STEEL

The drill runner is a busy guy—continuous boring through hard rock with high-speed drills. His job efficiency is dependent not only on his skill... but on the tools he uses. That's why in almost all drilling operations you'll find Crucible Hollow Drill Steel the number one choice.

This quality steel is built to take the punishment of around-the-clock operation of modern, high air-pressure rock drills. And you have the assurance of minimum breakage . . . and an end to expensive bit loss. That's because Crucible Hollow Drill Steel is backed by the experience of specialty steelmakers.

Insure the quality of your job—cut costs—use Crucible Hollow Drill Steel.



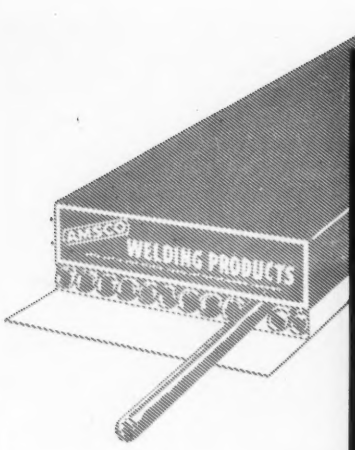
CRUCIBLE first name in special purpose steels

52 years of Fine steelmaking

HOLLOW DRILL STEEL

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REX HIGH SPEED • TOOL • REZISTAL STAINLESS • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS



NOW! Wear your point and have it too!

This new catalog can help you save money on repair costs . . .

It's packed with information on the new "Wear-Sharp"—and the entire AMSCO Weldment line. Complete with installation instructions and helpful hints on welding. Be sure to ask for your free copy.

AMSCO "Wear-Sharps" are available in two quickly and easily installed types:

Crescent Back
For application to worn tooth with minimum fitting.

Straight Back
For application after worn tooth is beveled.

U.S. Pat. No. 2,247,202

New AMSCO "Wear-Sharp" repointer holds a straight edge as it wears . . . and stays sharp longer!

Here's a new tooth repointer that is just what you've been looking for . . . the AMSCO "Wear-Sharp", *and it does exactly what the name implies.*

Note the groove design on this new repointer shown above. The outside and end grooves are AMSCOATED with Amsco Hardfacing Electrodes specially recommended for this purpose, while the inner grooves are left as they are. Result?

The Amscoated grooves wear slower, thus equalizing wear along the entire cutting edge and making the point stay sharp longer. Rounded, blunted corners that cut digging efficiency and waste power are completely eliminated for the life of the repointer!

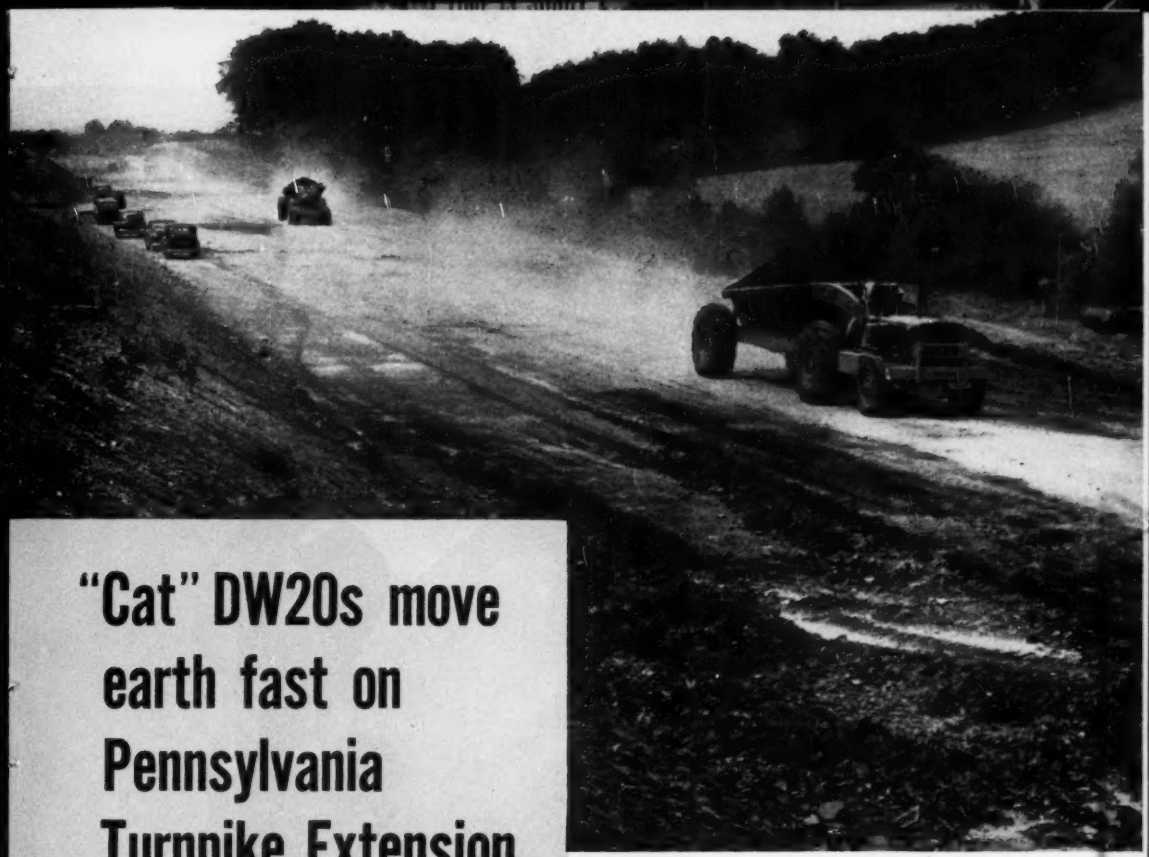
The "Wear-Sharp" is already setting new records in service life and digging efficiency. For example, an Eastern mine reports *6 times longer service than any repointer ever used before.*

The next time your dipper teeth need repointing, try the new "Wear-Sharp"! Write today for illustrated catalog shown at left—and name of your nearest AMSCO Distributor.

AMSCO WELDMENTS
THE RIGHT WAY TO MAKE REPAIRS

Brake Shoe **AMERICAN MANGANESE STEEL DIVISION**
385 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.
Amsco Welding Products distributed in Canada by Canadian Liquid Co., Ltd.



"Cat" DW20s move earth fast on Pennsylvania Turnpike Extension

Two of L. G. DeFelice & Son's "Cat" DW20s and W20 Wagons roll to the fill at 25 mph. with 20-yard loads. This $7,000,000 contract calls for moving 500,000 yards of earth.

L. G. DeFelice & Son, contractors on a 16-mile stretch of the western turnpike extension between Warrendale and Homewood, Pa., use eight "Caterpillar" DW20 Tractors and W20 Wagons for long-haul earthmoving. Handling 20 to 23 pay yards at a load, and making 2½ round trips per hour over a 1¼-mile haul route, the "big rigs" are operating 12 hours a day. That means the eight machines are hitting a daily average of close to 5,000 yards.

DeFelice's master mechanic likes the trouble-free operation of these husky wheel tractors. They outwork competitive equipment. And the fact that they're completely "Caterpillar"-built, including the engines, makes it easy to maintain and service them right along with the four D8s, six No. 12 Motor Graders and three No. 80 Scrapers that round out the "Caterpillar" fleet.

Wherever long, fast hauls call for wheels, the DW20 is making a reputation for big production and over-all economy. Owners who value such equipment take extra-good care of it these days. Proper maintenance will add to its long work life, and regular inspection by the "Caterpillar" service man will prevent down-time for repairs.

Your "Caterpillar" Dealer is the best friend your machines have. Make the most of all he has to offer.

CATERPILLAR, PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

STRIKE THIS BLOW MAINTENANCE

HAMMER TEST: Put a lump of *Texaco Marfak* about the size of a walnut on a smooth, solid surface. Then hit it as hard as you can with a good-sized hammer. See how *Texaco Marfak* cushions your blow, does not splatter. That's because *Texaco Marfak* is both adhesive and cohesive. It clings to the surface and *holds together* — a dramatic demonstration of how it stays in the bearings and protects chassis parts under the pounding of the roughest service.

See why chassis parts last longer with TEXACO MARFAK

Make the famous *Texaco Marfak* "Hammer Test" as described above. Note how *Texaco Marfak* cushions your hardest blows. The wonderful cohesive properties of *Texaco Marfak* prevent it from splattering like ordinary grease.

So it is in your chassis bearings. *Texaco Marfak* withstands the poundings of roughest roads . . . stays in the bearings for extra hundreds of miles . . . seals out dirt and moisture. *Texaco Marfak* stretches parts life because its tough, tenacious lubricating film gives better and longer lasting protection against wear and rust. Your maintenance dollars go farther.

In wheel bearings, use *Texaco Marfak Heavy Duty*. It seals itself in, seals out dirt and moisture for longer lasting protection. Will not leak onto brakes. No seasonal change required.

For Additional Economies

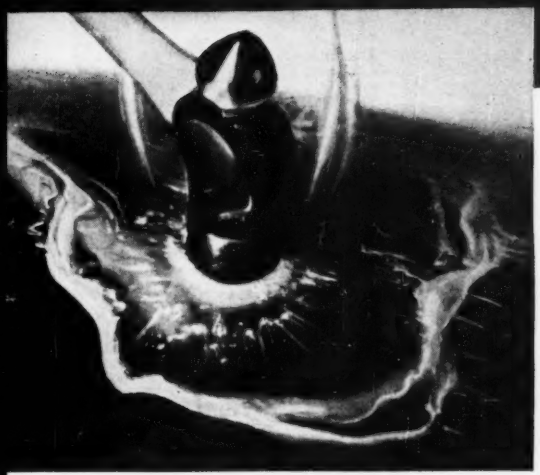
For engine economy, lubricate with *Texaco Ursa*

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. METROPOLITAN OPERA radio broadcasts every Saturday afternoon.

TEXACO

TEXACO

FOR LOWER COSTS . . .



TRY the "hammer test" with ordinary grease. Stand back and hit it! Note how it splatters, fails to hold together — proof that ordinary grease soon pounds out of chassis parts, leaves them unprotected, shortens their life. Fleet owners everywhere agree that *Texaco Marfak* gives the best protection under all conditions.

*Oil X***. Fully detergent and dispersive, this oil keeps engines clean, assures full power, less fuel consumption, lower maintenance costs.

Protect crawler track mechanisms with *Texaco Track Roll Lubricant*. It guards against moisture, dirt and wear under all operating conditions.

Let a Texaco Lubrication Engineer help you simplify your maintenance lubrication . . . keep your equipment on the job and out of the repair shop. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

MORE THAN 400 MILLION POUNDS OF MARFAK HAVE BEEN SOLD!

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Faithfully yours 50 *for Fifty Years*

DOMOR

ELEVATING GRADER

DIGS AND LOADS 14 CU. YARDS* IN LESS THAN ONE MINUTE!

The sharp disc of the Domor cuts a slice of sandy clay . . . conveys it to the W10 Wagon. The dirt is dropped from a low height, eliminating packing and hard dumping. Conveyor height is adjustable to load equipment up to 10-feet in height.

Domor-DW10's hustle 75,000 yards on Illinois road job!

Slicing off and loading enough hard-packed clay and loam to make a heaped load in a W10 Wagon takes less than a minute *with a DOMOR ELEVATING GRADER.*

That's the profit-building production that Contractor Leon B. Stilley got on a 175,000-yard road relocation job near Carmi, Illinois. Three DW10 Tractor-W10 Wagon teams raced to keep us with the fast-loading Domor Elevating Grader on a No. 12 Motor Grader. One man handles all the loading operations on the 75,000 yards assigned the Domor.

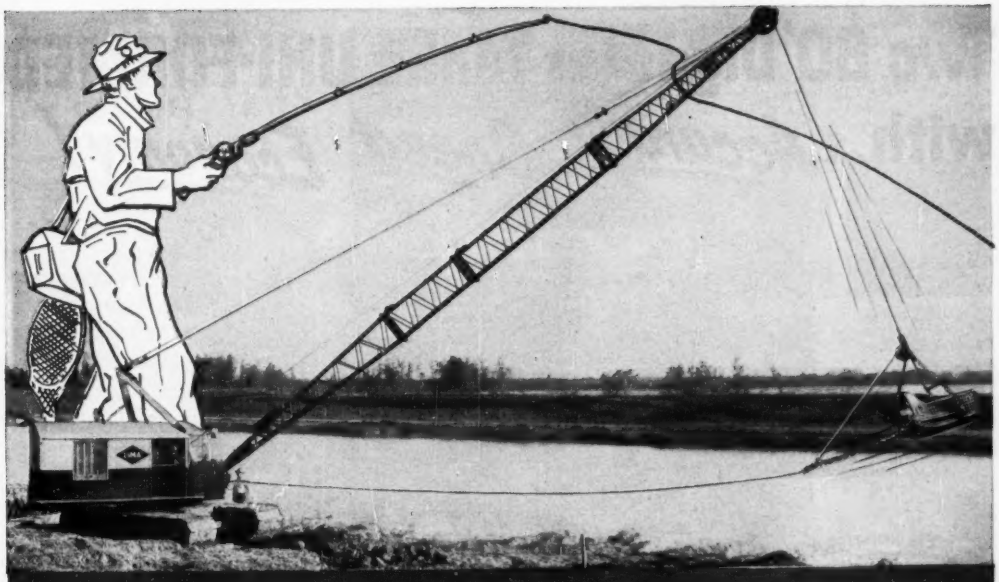
IT'S EASY TO CONVERT A DOMOR!

Only a few hours are required to change a No. 12 or 112 Motor Grader from blade to elevating grader and vice versa. No special tools or equipment are required and conversion can be made on the job. The value and profits of "Cat" Motor Graders can be doubled by a Domor Elevating Grader!

Any owner of a "Cat" Diesel No. 12 or 112 Motor Grader can have this same fast, low-cost loading production . . . and you can gain a host of other jobs — casting, terracing, ditching, stripping — with a Domor Elevating Grader! Ask your Domor-Caterpillar Dealer for full details . . . or write Ulrich Products Corporation, Roanoke, Illinois.

ULRICH PRODUCTS CORPORATION

ROANOKE, ILLINOIS



LIMA DRAGLINES use *The Fisherman's Secret* FOR A GOOD CATCH

When you're fishing, and want to drop the bait in the far pool where the big ones are waiting, your reel's got to be *friction-free* to let that line flow out, smooth as cream from a jug. And, after the strike, come in the same way.

When you're after record yardage, a smooth flowing line is just as vital . . . so we took a tip from the fisherman, and made our reels friction-free. You can 'cast' the dragline bucket further, increase your radius of efficient operation from each location. You can bring in bigger catches, because more power is going into the work lines and less into *friction drag on the machinery*. And there's further big benefits from reduced maintenance . . . less frequent lubrication, and smoother operation, because misalignment from bearing wear, that affects clutch alignment and functioning, is eliminated.

Lima pioneered the use of anti-friction bearings at all important bearing points on draglines, shovels, and cranes. They've kept on pioneering with other improvements that put Lima equipment in the top rank of profitable performers. If you want proof of this—just ask the Lima user. If you want details on how to put Lima equipment on your *pay-off* roll . . . just get in touch with us.

BALDWIN-LIMA-HAMILTON CORP.
LIMA-HAMILTON DIVISION
LIMA, OHIO, U. S. A.

OFFICES IN PRINCIPAL CITIES OF THE WORLD

BALDWIN-LIMA-HAMILTON

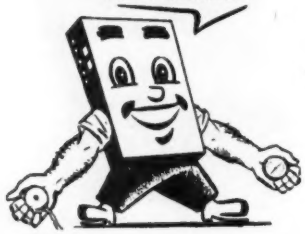
BALDWIN · BLH · LIMA-HAMILTON

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS • TRUCK CRANES

Two 80' Digester Tanks UNI-FORMED with... *Accuracy Speed Economy!*

5 Men
Erected and Braced
4500 sq. ft. in 20 hrs.
Walls Checked within ¼" of True Round
Part of Tucson Sewage Treatment Plant M. M. Sundt Construction Co., Contractors
SAFETY FIRST!
Clear Working Area . . .
Faster Forming . . . Easier
Concrete Placement
Allignment and Bracing on inside only

Only UNI-FORMS Provide 3-Way Savings . . . Time . . . Labor . . . Materials



THE JOB: Form and pour two 80' digester tanks. Walls vary from 15 to 21 inches, are 32 feet high. Tolerance ½". Forms must check within ¼" of true round. Concrete to be of high density, watertight consistency with a smooth face.

THE PROBLEM: Maintain required tolerances. Form and hold two pours—18 and 14 ft. high. Obtain maximum speed and economy in entire forming and pouring operation.

THE RESULT: UNI-FORMS were used to form the job. In spite of the high lift and accuracy required, alignment and bracing was necessary on 1 side only. Accuracy was maintained throughout. Erection of panels was fast—5 men erected 4500 sq. ft. of first lift in 20 hours. Finished concrete surface met specifications for smoothness. Contractor expects to finish job several months ahead of schedule. Congratulations to M. M. SUNDT CONSTRUCTION CO. for a job well done.

Universal FORM CLAMP CO.
Concrete Form Specialists Since 1912

General Offices and Factory • 1236-38 NORTH KOSTNER • CHICAGO 51, ILLINOIS • CAPITOL 7-1600

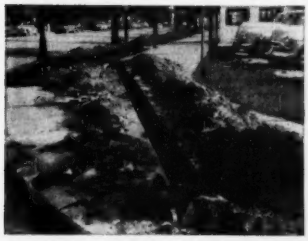
Branch Offices and Warehouses:

- SAN LEANDRO, CAL., 2051-9 Williams St.
- DALLAS, TEXAS, 3310 Ramsey St.
- HOUSTON, TEXAS, 2314 Preston Ave.
- EUCLID, OHIO, 24901 Lakeland Blvd.
- NEW YORK, N. Y., 51 E. 42nd St.
- BALTIMORE, MD., 661 S. Monroe St.
- SWAMPSCOTT, MASS., 51 Barnstable St.
- HATO REY, PUERTO RICO, Ave. Muncz Rivera 84—Stop 27½

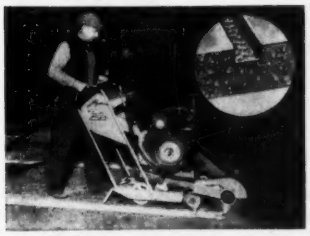
Service Wherever You Build... Coast-to-Coast

CONSTRUCTION EQUIPMENT NEWS

A Preview of Equipment That Will Help You On the Job



PATCHES—TRENCHES SAWED FOR FLOOR—STREET REPAIR — Saw concrete floors, walks or streets! Saw narrow slit trenches 1" wide for conduit or any width for utility lines. Eliminate jackhammer fractures beyond the straight, smooth sawed lines.—**Write Clipper Mfg. Co., 2809 N. W. Warwick, Kansas City 8, Mo.**



FLOORS, DRIVES, RUNWAYS EASILY CUT FOR REPAIRS— Rail tunnels, rail and pipe trenches, air lines and machinery bases were cut in dense concrete with a Model C-130 Clipper Concrete Saw and CDS-20 Diamond Blade at the rate of 5' per minute—3" deep. Tremendous savings were claimed by the contractor in removal and replacement.—**Write Clipper Mfg. Co., 2809 N.W. Warwick, Kansas City 8, Mo.**

TRACK SAW NOW CUTS LARGEST STONE, TRANSITE, TERRA COTTA — By placing C-15 Clipper Concrete Saw on tracks, a Cleveland contractor cut limestone veneer units from 15'x7"x15" quarry lengths. In addition to large, bulky shapes this model is efficient and dustless for inside patch and trench work.—**Write Clipper Mfg. Co., 2809 N.W. Warwick, Kansas City 8, Mo.**

(Advertisement)

CONTRACTION JOINTS NOW SAWED—Floors, walks, drives and runways now poured continuously (reduces bulkheading!) Then joints are sawed to eliminate hand forming and costly spalling.—**Clipper Mfg. Co., 2809 N. W. Warwick, Kansas City 8, Mo.**

STUDIES OF SAWED JOINTS PROVE VIRTUAL ELIMINATION OF SPALLING — Highway transverse joints sawed 2" deep are devoid of spalling after 1½ years in contrast to heavy spalling in a few weeks on formed joints, according to State tests.

Typical spalling after few weeks heavy traffic.

Sawed joints on same highway after 1½ years.

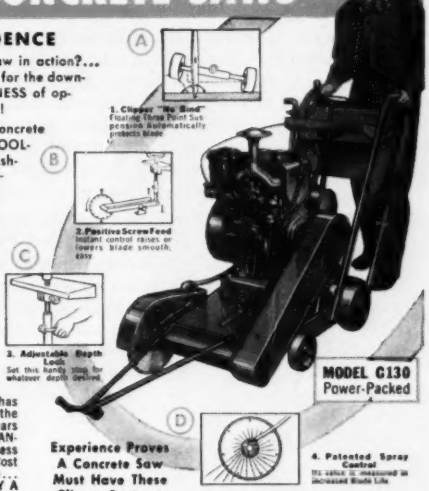
It's Done Easier, Faster, More Economical when you SAW BEFORE BREAKING with CLIPPER CONCRETE SAWS

CONCRETE EVIDENCE

Ever watch a Clipper Concrete Saw in action?... If not you've missed something... for the downright SPEED, EASE and SMOOTHNESS of operation is really something to see!

You'll recognize that Clipper Concrete Saws are designed for SIMPLE, FOOLPROOF DUSTLESS performance. Dashboard controls—perfect balance—floating three point blade suspension* — and "job-rated" power plants...all combined for concrete and asphalt cutting far beyond anyones expectations.

*A pivoting front axle keeps the blade straight in the cut even on rough surfaces—stops binding—stops excessive blade costs.


A
1. Clipper "No Bind" Floating Three Point Suspension Automatically protects blade
B
2. Positive Screw Feed Instant control raises or lowers blade smooth, easy
C
3. Adjustable Depth Lock Set this handy stop for whatever depth desired
D
4. Patented Spray Control
MODEL C130 Power-Packed

FREE TRIAL...

The outstanding policy of FREE TRIAL has been in effect since Clipper invented the World's First Masonry Saw many years ago! Clipper Concrete Saws are GUARANTEED to: Provide—regardless of hardness ...the Fastest Cut...at the Lowest Cost ...with the Greatest Ease...Anytime... Anywhere! You be the judge...TRY A CLIPPER ON **FREE TRIAL!**

Experience Proves A Concrete Saw Must Have These Clipper Features

Clipper

KANSAS CITY 8, MISSOURI

PITTSBURGH, ST. LOUIS, CLEVELAND, INDIANAPOLIS, DETROIT, HOUSTON, AUSTIN, TEX., CHICAGO, LOS ANGELES, PHILADELPHIA, SAN FRANCISCO, CINCINNATI, NEW YORK, ATLANTA, WASHINGTON, D.C., BOSTON, BIRMINGHAM, KANSAS CITY

"COAST-TO-COAST"

Serving the World as the World's Largest Manufacturer of Masonry Saws

CLIPPER DIAMOND BLADES

• A complete selection of blade types for every sawing job... SAW asphalt or concrete floors, or SAW contraction joints in fresh poured slabs.

CLIPPER MANUFACTURING CO.
CONCRETE SAW DIVISION
2809 N.W. WARWICK KANSAS CITY 8, MO.
Send FREE Literature, Information and Prices on the NEW CLIPPER CONCRETE SAWS 8C

NAME _____
COMPANY _____
STREET _____
CITY _____ STATE _____

SOLD ONLY DIRECT FROM FACTORY

On the New Jersey Turnpike

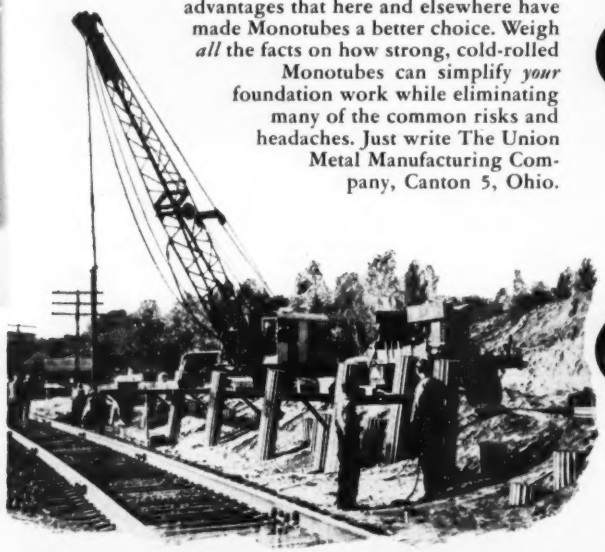
...MONOTUBES

for simplified, speedy foundation work

THESE and many other overpasses play a vital part in making the New Jersey Turnpike a "Miracle Highway". And, versatile Monotube piles went into *all* types of overpass construction—because they offer unique advantages.

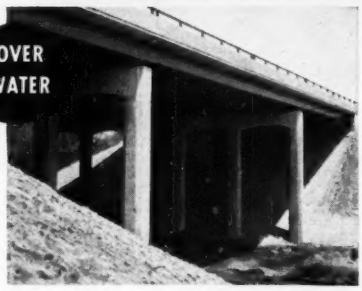
For example, speedy construction was possible with light weight Monotubes, installed with fast, mobile driving equipment. There was minimum time loss in moving between the widely separated structures. *On* the job, Monotubes saved still more time and money due to their ready extendibility, simplified field splicing, easy cut-off and minimum waste . . . and, due again to their light weight that speeded locating and driving to any required depth.

These are only a few of the key advantages that here and elsewhere have made Monotubes a better choice. Weigh *all* the facts on how strong, cold-rolled Monotubes can simplify *your* foundation work while eliminating many of the common risks and headaches. Just write The Union Metal Manufacturing Company, Canton 5, Ohio.



OVER RAILROADS

OVER WATER



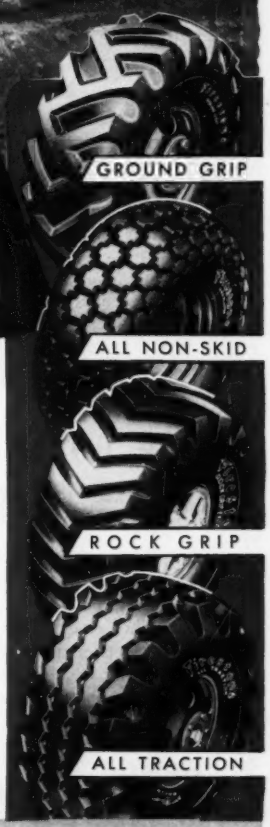
OVER HIGHWAYS

UNION METAL

Monotube Foundation Piles

MAKING TIME or MARKING TIME-
The Difference is YOUR PROFIT

Firestone
OFF-THE-HIGHWAY TIRES
MAKE THE DIFFERENCE



YOUR profit on the job is the difference between going through and going down. And the tires that make those profits possible are the tires that develop the greatest traction and have the strength to take it.

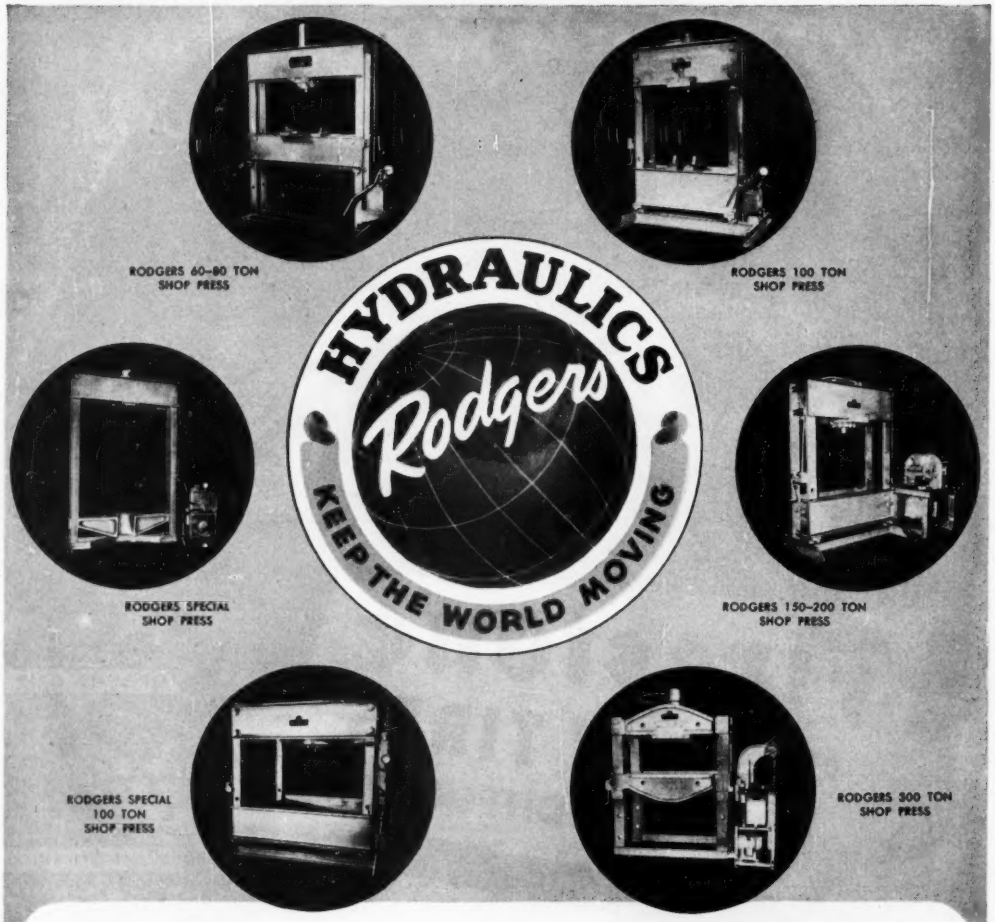
Firestone Tires give you extra service at no extra cost because they are built with extra strong Gum-Dipped rayon cord bodies . . . built with four extra impact plies to protect the bodies . . . built with double-thick, snag-resistant sidewalls . . . built with extra heavy treads engineered to fit the job. Firestone Tires not only run longer, but they always give maximum traction to cut your loading time and increase the operating efficiency of your equipment.

See your nearby Firestone Dealer or Store. Let them show you how Firestone Off-The-Highway Tires will cut your downtime and increase your profits.

WHEN YOU BUY NEW EQUIPMENT OR REPLACEMENT TIRES, SPECIFY FIRESTONE

Enjoy the Voice of Firestone on radio or television every Monday evening over NBC

Copyright, 1951, The Firestone Tire & Rubber Co.


HYDRAULICS
Rodgers
KEEP THE WORLD MOVING
RODGERS 60–80 TON SHOP PRESS
RODGERS 100 TON SHOP PRESS
RODGERS SPECIAL SHOP PRESS
RODGERS 150–200 TON SHOP PRESS
RODGERS SPECIAL 100 TON SHOP PRESS
RODGERS 300 TON SHOP PRESS

FOR 101 UNUSUAL JOBS THERE'S NOTHING LIKE A

RODGERS SHOP PRESS

YES, a Rodgers Hydraulic Shop Press is about the handiest piece of equipment you can find for those many pressing, forming, bending and straightening jobs, for die tryout, short production runs and scores of other uses. They are versatile, time-and-labor-saving presses with construction and operating features that make them adaptable to all requirements . . . Standard model presses are available in 60, 80, 100, 150, 200, 300 and 400 ton capacities with hand or power pumps—special or modified units will be supplied to specifications.

Send for Catalog

Rodgers Catalog No. 313A has descriptions and specifications on the complete line of Shop Presses.

HYDRAULICS Rodgers

Rodgers Hydraulic, Inc.

7403 Walker St., St. Louis Park, Minneapolis 16, Minn.

HYDRAULIC POWER EQUIPMENT

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on Louisiana Pipe Line Project

The Houston Contracting Co., Houston, Texas, has recently completed the laying of a pipe line for the Texas Gas Transmission Co. near Shreveport, Louisiana. Equipment performed smoothly and dependably with the help of Gulf quality lubricants and fuels.

THE Houston Contracting Co., like many other leading contractors, has a proven formula for making equipment deliver beat-the-schedule performance: Gulf quality lubricants and fuels, plus careful maintenance. This formula pays big dividends.

Always of the same uniform high quality, Gulf lubricants and fuels work as a team to help contractors do a speedier, more profitable job. Gulf lubricants provide an extra margin of protection against mechanical delays, and Gulf fuels insure maximum engine power and efficiency.

Write, wire, or phone your nearest Gulf office and arrange to use Gulf quality products on your next job. Along with that good Gulf service, they are quickly available to you through more than 1400 warehouses located in 33 states from Maine to New Mexico.

Gulf Oil Corporation · Gulf Refining Company,
Gulf Building, Pittsburgh 30, Pennsylvania.

GULF

Now...
ARC-DRIVE CONTROL
for D-C Rectifier Welder

. . . INSTANTANEOUS RESPONSE TO ARC-LOAD CHANGES
. . . INSTANTANEOUS RECOVERY
. . . REDUCED ARC BLOW
. . . COMPLETELY ADJUSTABLE BY OPERATOR

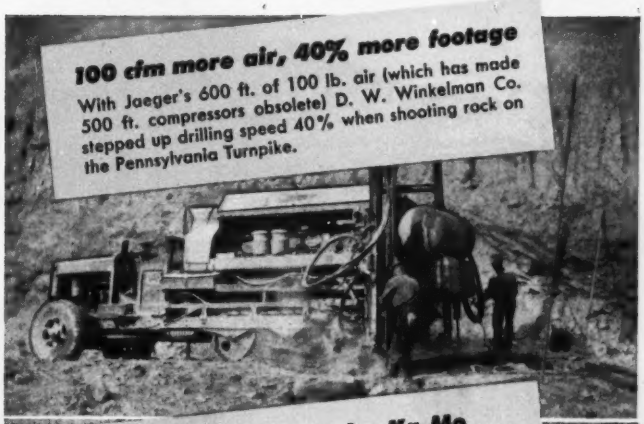
Westinghouse RA Welders with new positive arc-drive control now prevent shorting when used on "drag" welding applications. In addition, they allow complete penetration on root passes of vertical and overhead welds. Arc-drive control is obtained by adjusting the ratio of short-circuit current to welding current without changing open-circuit voltage. Actual amount of arc-drive current can be varied by the operator.

For information on this improved RA Welder or other Westinghouse Welding Equipment, write Westinghouse Electric Corporation, Dept. DC72, Welding Division, Buffalo, New York.

J-21607

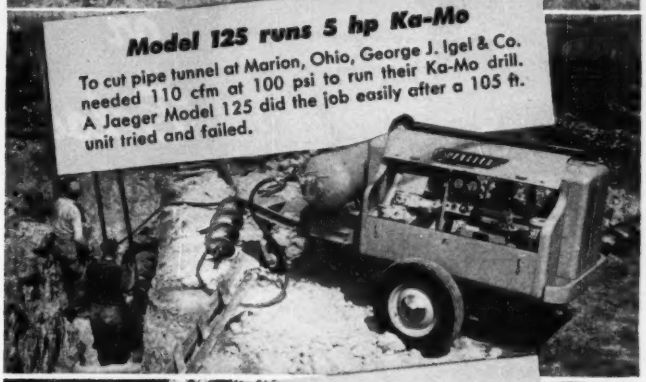
YOU CAN BE SURE ... IF IT'S
Westinghouse
WELDING EQUIPMENT

Air-starved tools get up and go with Jaeger "air plus" pressure



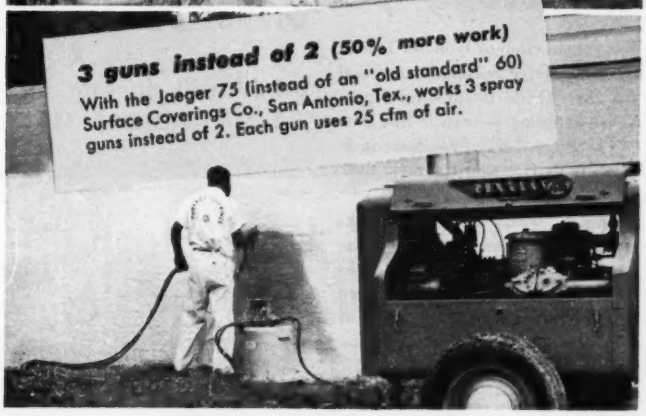
100 cfm more air, 40% more footage

With Jaeger's 600 ft. of 100 lb. air (which has made 500 ft. compressors obsolete) D. W. Winkelman Co. stepped up drilling speed 40% when shooting rock on the Pennsylvania Turnpike.



Model 125 runs 5 hp Ka-Mo

To cut pipe tunnel at Marion, Ohio, George J. Igel & Co. needed 110 cfm at 100 psi to run their Ka-Mo drill. A Jaeger Model 125 did the job easily after a 105 ft. unit tried and failed.



3 guns instead of 2 (50% more work)

With the Jaeger 75 (instead of an "old standard" 60) Surface Coverings Co., San Antonio, Tex., works 3 spray guns instead of 2. Each gun uses 25 cfm of air.

Want to cut costs? See your Jaeger dealer—or send for Catalog JC-1

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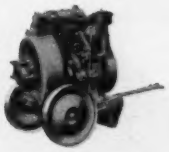
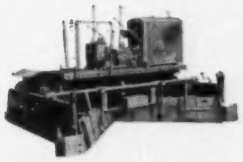
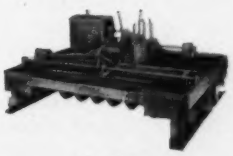


"Sure Prime" Pumps, 3600 to 240,000 gph

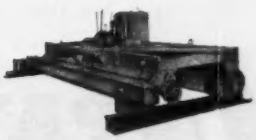
"Speedline" Mixers, 3½ S to 16 S



Paver-Type Aggregate Spreaders

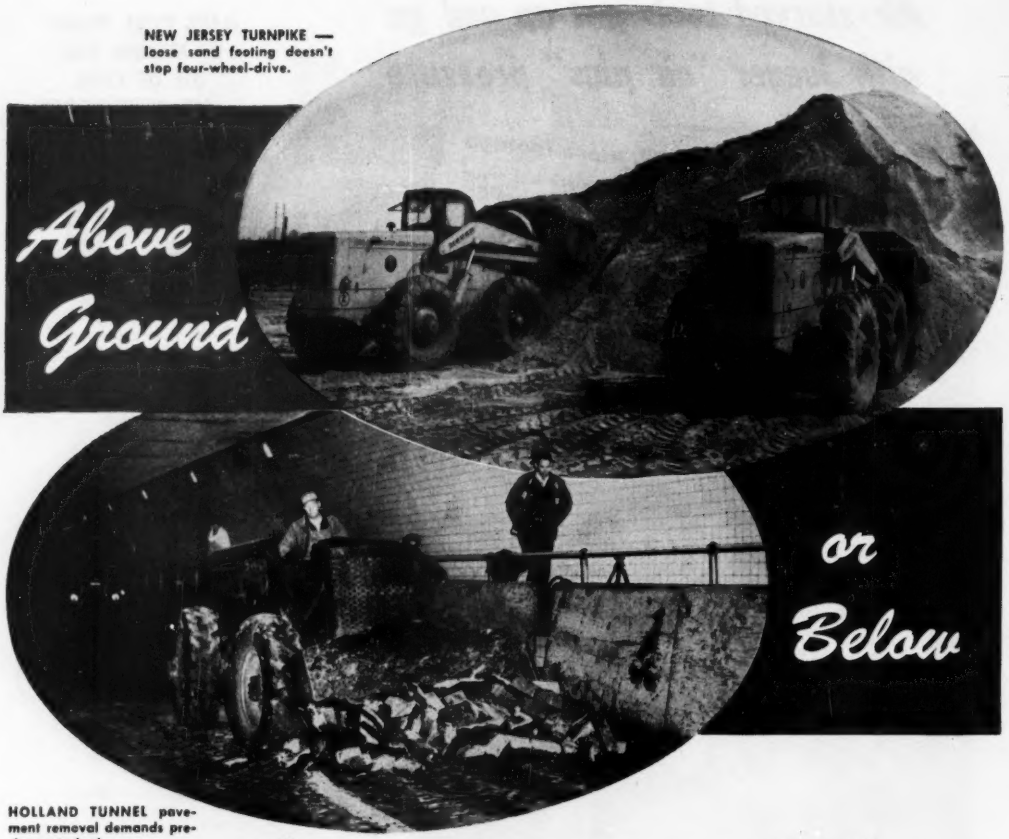


Concrete Screw-and-Screed Spreaders



Diagonal Screed Finishers

NEW JERSEY TURNPIKE — loose sand footing doesn't stop four-wheel-drive.



HOLLAND TUNNEL pavement removal demands precise control, plus power.

Versatility Pays Off

WHETHER on the New Jersey Turnpike construction or Holland Tunnel repaving, the combination of four-wheel-drive, large pneumatic tires and *power* of this big, compact 1½-yd. "PAYLOADER" tractor-shovel pays off. It has fast-action traction on all kinds of footing — crawler-like traction at far less maintenance expense — PLUS speed when you want it. It has *versatility* to work on sand, mud, snow or clay and to travel over streets and highways at 16 mph.

This "PAYLOADER" also gives you easy operation and maneuvering speed with power-boosted steering and four speeds in reverse as well as forward . . . and is available with gasoline *or* diesel power. Hundreds of contractors are enthusiastic owners and boosters and once you've seen an HM in action you'll understand why. You'll find them on all kinds of construction projects from turnpikes to tunnels. The Frank G. Hough Co., 706 Sunnyside Ave., Libertyville, Illinois.

TRU-LAY *Preformed* Wire Rope

- *PERFORMS BETTER*
- *HANDLES EASIER*
- *SAFER TO USE*
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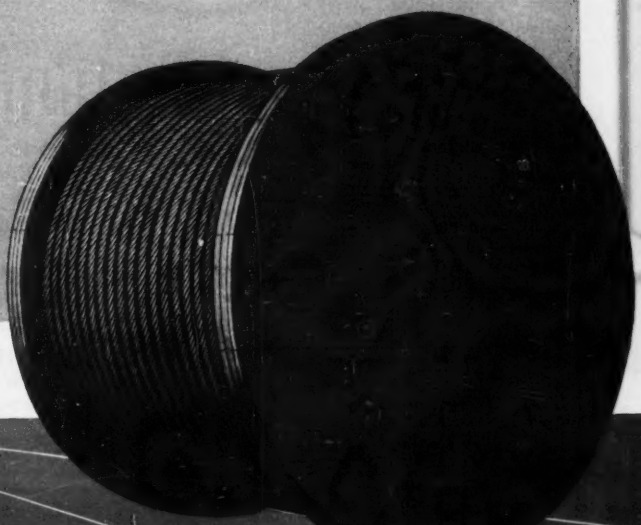
Available
through Distributors
ALL AROUND AMERICA



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for
tools subject to abrasion and severe impact

TYPICAL APPLICATIONS

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for
thin and smooth cutting edges

TYPICAL APPLICATIONS

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for severe abrasion

TYPICAL APPLICATIONS

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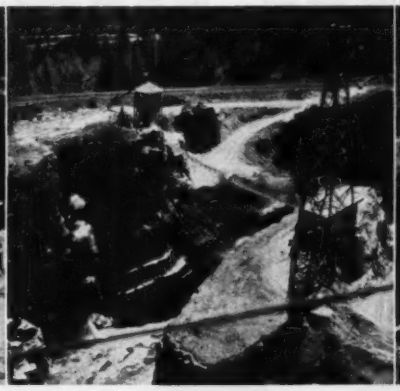
ENGINEERING WITH ATLAS EXPLOSIVES

ONE ROCKMASTER® BLAST dams a river gorge

1. *The sheer walls of Cabinet Gorge in Idaho rise 350 feet above the swift Clark Fork River. Morrison-Knudsen Co., Inc. had to throw a cofferdam across waters 70 to 80 feet deep—too tough a job for truck dumping or sheet piling. So M-K used explosives.*



2. *The blast starts. Nearly 65,000 pounds of Atlas Flo-dyn #4 (40% free-flowing dynamite) were used.* ROCKMASTER *millisecond delay detonators Nos. 0 to 11 were used for accurate control of throw across the river.* ROCKMASTER *timing fired forward end first.*

3. *The two lower benches move riverward —an example of how milli-second delay timing is used to throw rock to a designated spot. Vibration and overbreak were not factors in this blast, but note that the cement silo is undamaged and the footbridge remains up.*

4. *A second after detonation the front burst is over; bottom and top falling fast. This was a coyote-tunnel blast. But the multiple one-two punches of* ROCKMASTER *give the same control with well or wagon drill holes.*

5. *Water splashes high in displacement. Success was evident immediately after the blast when water started flowing through two tunnels prepared to divert stream. Atlas sales-technical men cooperated with Morrison-Knudsen.*

6. *Dust has settled. More than 90,000 cubic yards of rock, thrown directly across the stream as aimed, are ready for final grading and will serve as basis for further cofferdam installations.*

This was a *big* job. But even on small jobs you can profit by ROCKMASTER control. Find out how milli-second delay timing can work for *you*—send for free 20-page book, with diagrams, outlining the control possible with ROCKMASTER blasting.

ATLAS EXPLOSIVES

ATLAS

"Everything for Blasting"

ATLAS POWDER COMPANY • WILMINGTON 99, DELAWARE

Offices in principal cities

Rope leads from

UPSON-WALTON

Selecting the "lay" of wire rope

● An important characteristic of a wire rope is its *lay*—the relative directions in which wires in the strands, and strands in the rope are twisted.

In *regular lay* rope, the wires in the strands are twisted in the opposite direction to the strands in the rope.

However *lang lay* rope—in which wires and strands are twisted in the same direction—offers several advantages:

- **it flexes better**
- **it has more resistance to abrasion**
- **it has more resistance to bending fatigue**

When choosing *lang lay*, be sure to specify that it be "preformed". An extra operation in the manufacture of Upson-Walton's LAYRITE preformed rope forms the wires and strands in a fixed spiral. This frees each part from internal stress. Years of rugged service have shown that Upson-Walton's LAYRITE wears longer, cuts maintenance costs.

Specify it on your next tough job.

THE UPSON-WALTON CO.
CLEVELAND, OHIO
NEW YORK • CHICAGO • PITTSBURGH

wire rope • rope fittings • tackle blocks

MATCH YOUR WIRE ROPE TO YOUR FITTINGS AND BLOCKS... ONLY UPSON WALTON OFFERS ALL THREE

STANOLUBE HD-M

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Motor Oil

a new, tougher oil for tougher jobs!

● Since the introduction of STANOLUBE HD Motor Oil in 1942, Standard has led the way in the development of additive-containing lubricants for automotive and diesel engines. New STANOLUBE HD-M is tailored to meet the demands of today's increased severity of operating conditions. It's a tougher oil for tougher jobs! Here's what it offers to operators of heavy-duty equipment:

Longer engine life results from STANOLUBE HD-M's improved detergent-dispersant action. Engines stay clean under the tougher operating conditions caused by adverse fuel quality, higher running temperatures, and prolonged periods of severe service. Freedom from deposits means less engine wear. Less engine wear means longer engine life.

Lower maintenance costs result from STANOLUBE HD-M's greater oxidation stability. It helps keep pistons, rings, and valve stems free from varnish-like deposits and provides protective films of oil in the face of high operating temperatures. Less wear on engine parts and longer periods between overhauls mean lower maintenance costs.

Your nearby Standard Oil service-supply center stocks STANOLUBE HD-M Motor Oil for fast *local* delivery. This service-supply center is also headquarters for your Standard Oil lubrication specialist. Call him today. He can help you obtain maximum lubrication benefits with STANOLUBE HD-M . . . a tougher oil for tougher jobs! Or write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY *(Indiana)*

STANDARD

if all suits were 38 regular

Impossible situation? No, it's just the problem cement users face when using air entrained concrete.

All air entraining cements are standardized by Federal and A.S.T.M. specifications. For many jobs these cements are adequate. They produce a concrete with all the excellent qualities resulting from properly entrained air.

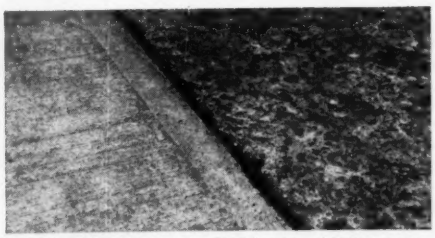
But air entraining cements lack the versatility to be a "cure-all." The local materials used, and the requirements of the locality and the job, are variables that may result in concrete being unsatisfactory when made with standardized air entraining cement.

To avoid a situation like this we recommend the following procedure: Use regular portland cement and add any readily available air entraining agent in the quantity necessary to meet the requirements of your particular job. It's like having your suit tailor made, and it's simple to do.

Always be *sure* an air entraining cement will do the job. If so, remember you can't buy a better one than Marquette Air Entraining Cement.

★ ★ ★

If you have any problems or questions on the use and mixing of air entrained concrete, the Marquette Service Engineer will be glad to help and advise you—contact any Marquette office.



Correct air entrainment means a successful job (see slab on left). Too little or too much can be as disastrous as none at all (see slab on right).

Marquette Cements

Marquette Cement Manufacturing Company

SALES OFFICES: Chicago • St. Louis • Memphis • Jackson, Miss. • **PLANTS:** Oglesby, Ill. Des Moines, Ia. • Cape Girardeau, Mo. • Nashville, Tenn. • Cowan, Tenn. • Brandon, Miss.

Portland • High Early Strength • Air Entraining • Masonry

We Engineered the Mechanical Advantages Of Big Shovels into the Dempster-Diggster

The Dempster-Diggster's ability to dig hard and stratified materials without shooting is shown in photo at right. Note ample loading clearance. Dempster-Diggster, shown at work in Florence, Ala., is the Type GRD, Model 100.

This Dempster-Diggster, shown at work in Creighton, Pa., is also loading hard and stratified material without shooting. It is the Type CR, Model 100.

The Type GRD, Model 100-HL is shown above loading Hopper Bottom car, height of which is 10'8" from rail to top of car.

Simultaneous Independent Hydraulic Crowding and Hoisting, Variable Crowd Action at Any Dipper Position and Changeable Buckets are engineered into the Dempster-Diggster. Many of the present Dempster-Diggster owners were at one time in the same position you may be in today. They needed front end loaders, but they also needed shovels that could dig out 15 to 18 foot banks. The versatility of the Dempster-Diggster, plus its economical and efficient operation, left them with only one choice. In the first place, the Dempster-Diggster can do anything a conventional front end loader can do—and do it faster and at less cost! Second, on big jobs the Dempster-Diggster is without equal for working in tight places. The Dempster-Diggster is available in either of two types of traction—pneumatic (Type GRD) or crawler (Type CR). Both types are supplied in two models—the Standard (Model 100) or High Lift (Model 100-HL). Our new catalog No. 1032, with over 35 illustrations and complete specifications, shows how this revolutionary shovel can cut your costs tremendously. For your copy fill in the attached coupon and mail today!

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Please send me, without obligation, your Dempster-Diggster Catalog #1032.

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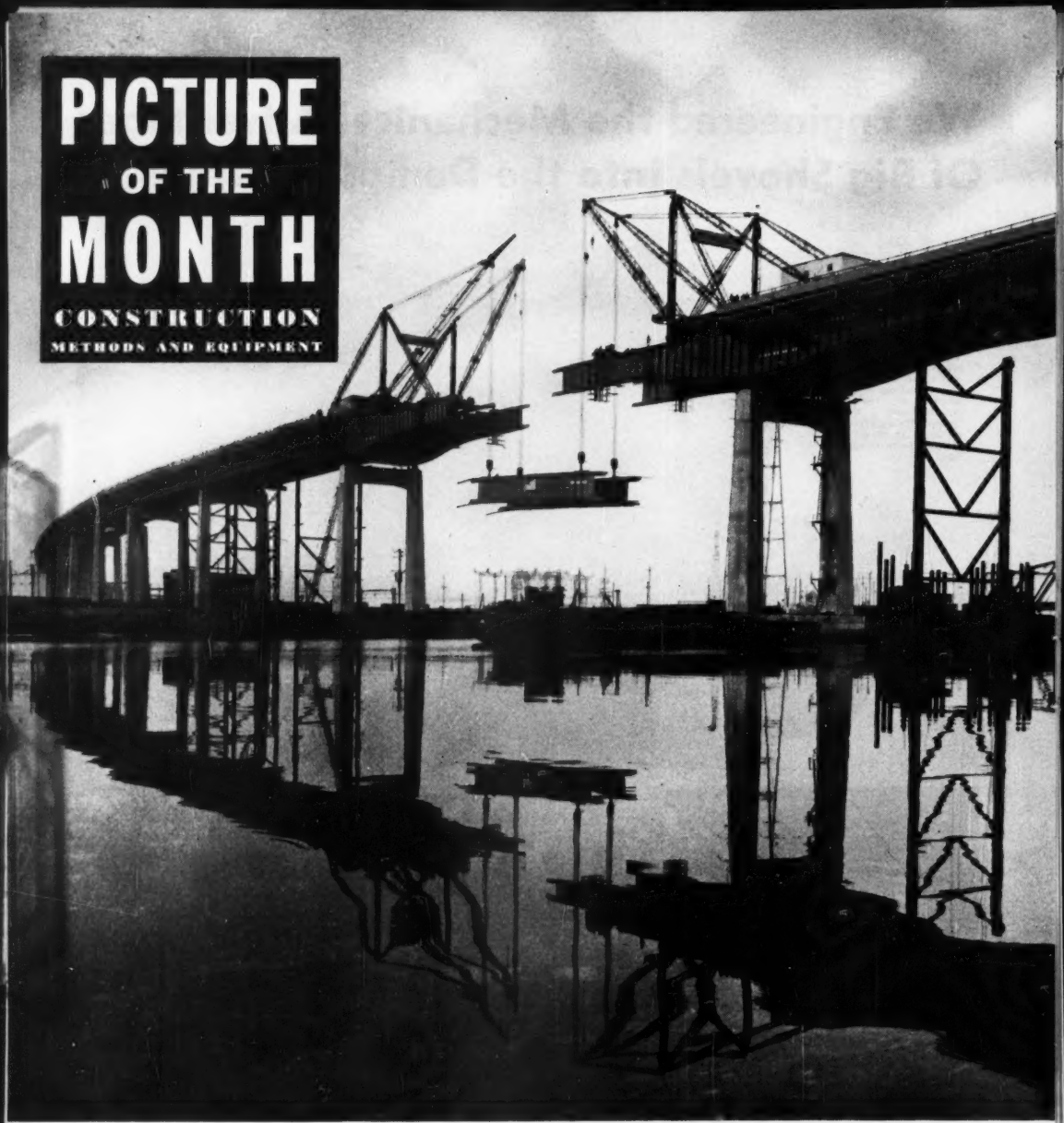
PICTURE OF THE MONTH

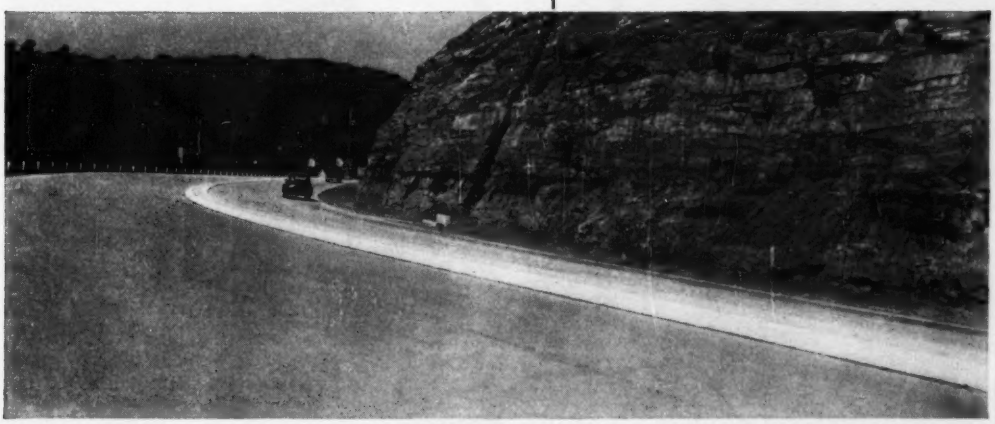
CONSTRUCTION METHODS AND EQUIPMENT



One Lift . . . Two Girders . . . Four Derricks

MIRRORED in the placid waters of the Passaic River near Newark, two 14x115-ft girders are lifted at one time to be connected to 130-ft cantilever arms to close the last gap in a New Jersey Turnpike bridge. Bethlehem Steel Co.'s simultaneous erection of the two 146-ton units —an unprecedented operation—saves much time and prevents wracking of bridge members that might have occurred had each girder been raised separately. Making the heavy lift are four American Hoist & Derrick Co. stifflegs. They are fitted with 57-ft masts, 115-ft booms, and are rated 100 tons at 75 ft. Mounted two per traveler, the derricks are powered by American 200-hp gasoline-driven torque-converter air-controlled hoists with a 20,000-lb line pull at 200 fpm. This 375-ft plate girder main span, part of a 7,000-ft structure for which Bethlehem fabricated and erected 22,000 tons of steel, is one of the two longest of its type in the United States.

This highway was "winterized" when it was built —with DURAPLASTIC



Section of highway in Allegheny County, Pa., near Pittsburgh, built with Duraplastic. White concrete reflecting curbs made with Atlas White Duraplastic. Designed by Pennsylvania State Highway Dept. General contractor: Harrison Construction Company, Pittsburgh; paving sub-contractor: McCrady Construction Company, Pittsburgh; White curb installed by E. Arthur James, Johnstown, Pa.

Come freeze or thaw or de-icing salt, this section of highway near Pittsburgh is ready for the winter's worst, because the concrete was made with Atlas Duraplastic air-entraining portland cement.

Duraplastic makes more durable concrete because it minimizes segregation and bleeding. Thus, concrete is fortified against the effects of freezing-thawing weather and the scaling action of de-icing salts.

Less mixing water is required for a given slump with Duraplastic cement. It makes concrete more workable, more cohesive and more uniform. Naturally, such a mix dumps, spreads and finishes easily. And it allows finishing close to the paver . . . permits earlier protection for curing.

YET DURAPLASTIC* COSTS NO MORE

It sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

OFFICES: *Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.*

**"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.* CM-D-123

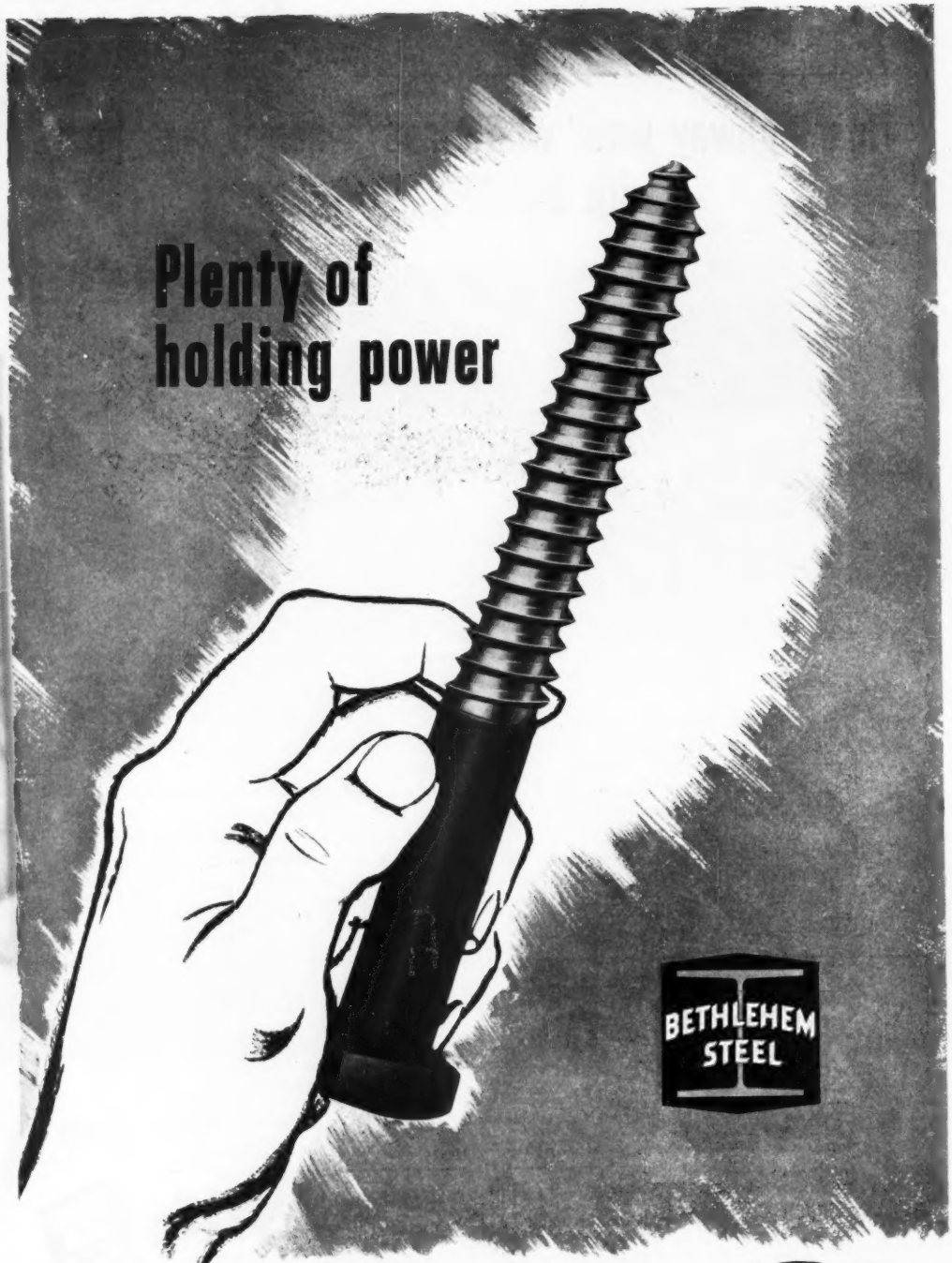
ATLAS®

DURAPLASTIC

AIR-ENTRAINING PORTLAND CEMENT

Makes Better Concrete at No Extra Cost

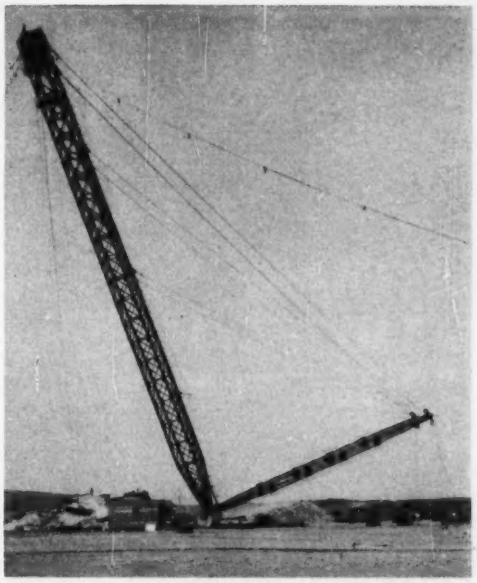
"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*



Bethlehem supplies every type of Fastener

Construction News in Pictures...

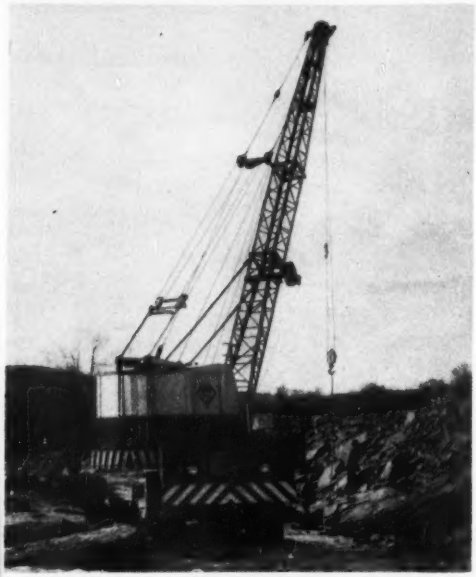
WHERE THERE'S A WILL there's a way to ski in southern California. At the recent Los Angeles County Fair in Pomona, this ski slide, 225 ft high, was constructed of standard Safway tubular steel frame-type scaffolding—manufactured and erected by Safway Steel Products, Inc., Milwaukee. The runway is 10 ft wide at the top and flares out to 40 ft at the base. Yes, the snow is artificial.



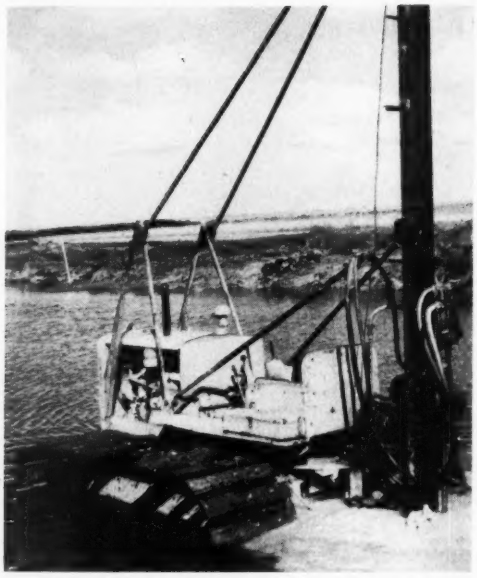
UP GOES TAIL TOWER 240 ft high, 10 ft in dia, for twin 2,500-ft highlines across Columbia River at Chief Joseph Dam in north central Washington. Tower was fabricated horizontally on the ground and 80-ft crane booms attached vertically to base. Lines, reeved to booms and anchored to deadmen were hauled by two D8 Caterpillar tractors to raise towers. Chief Joseph Builders are building the dam.—Corps of Engineers Photo

FINAL STEEL SECTION is lifted into place by two Lorain Moto-Cranes for a pedestrian overcrossing spanning the Romona Freeway in Los Angeles. Consolidated Western Steel Corp. erected the 265-ft welded steel bridge in ½ day, kept traffic moving on the freeway. Largest section of the $70,000 structure is 133 ft long and weighs 24 tons; second largest measures 86 ft, weighs 18½ tons; center section is 45 ft long, weighs 9 tons. An 8-ft walkway of concrete will be laid down and circular ramps are to be installed for entrance and exit. The high center clearance, 23½ ft, leaves room for a rapid transit right-of-way.

(Continued on page 42)

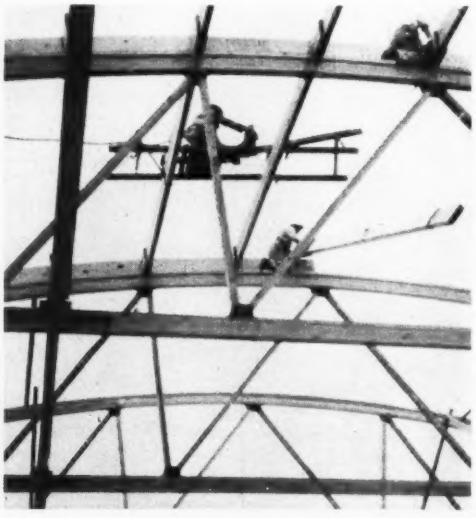


STREAM-LINING — John Arborio, Poughkeepsie, N. Y., contractor recently took his rubber-tired Lima Paymaster wading in order to place riprap on the side slope of newly widened Route 17 outside Elmira, N. Y. New pavement wouldn't take the weight of the crane for at least two more weeks; hence the water treatment. Rock had been pulled out of fill and thrown temporarily into stream during construction.



WEB-FOOTED CAT — Power take-off on Caterpillar D6 with track extensions runs rig to drill 14-ft blast holes in coral underlying flooded muck. Project is a drainage canal in the Florida Everglades, being pushed through by Hooper Construction Co., Coral Gables. Gardner-Denver 500-cfm compressor on bank supplies air. Each hole shot loosens about 30 yd of material; excavation is by Link-Belt Speeder dragline.

WINCH ON SLED — Stolte, Inc., Oakland, Calif., contractors, mounted an air-driven winch on a light timber frame with a rigid timber boom set at 30 deg. Behind winch is a plank platform for operator and mechanism to lock sled to roof joists while lifting lumber for further construction on a warehouse. In operation, first few joists between main trusses are placed by crane or manhandled into position. Air-winch then is hoisted up and made to straddle several joists. Winch cable lifts timbers as they are needed and is moved across joists for next lift after carpenters have spiked joists. By looping the hoist cable around a roof timber, the operator moves the winch-sled forward under its own power. A snubber line to sled is held by ground personnel during moves, for added safety.



SUPERIOR

CONTINUOUS THREADED COIL RODS . . .

Goodyear's nationwide campaign for better roads

is arousing nationwide demand for action!

These forceful editorials are only a few of the many acclaiming Goodyear's timely series of advertisements running in national publications in behalf of a *modern* highway system. Appearing in leading newspapers across the country, they commend Goodyear for "awakening interest and demand" in better roads.

Another reason why it pays always to BUY and SPECIFY

GOODYEAR

THE GREATEST NAME IN RUBBER

Volume 34
Number 1

CONSTRUCTION
METHODS AND EQUIPMENT

JANUARY
1952

Harold W. Richardson, Editor

O Justice, Where Art Thou?

FAR BE IT FROM US to quarrel with the United States Supreme Court, but we can't help but feel that a lot of justice went down the creek around the cofferdam when that august body, by decision on November 26, denied contractors the right of judicial appeal from rulings of government department heads, except in case of fraud. We're not alone in our belief either, for Justices Douglas, Reed and Jackson wrote vigorous dissenting opinions.

The Court's decision grew out of the government's appeal from a Court of Claims award to Wunderlich Contracting Co., Omaha, of $155,748 in connection with a dispute with the Bureau of Reclamation over equipment rentals and repairs on extra work at Vallecito Dam in Colorado in 1939-40. Wunderlich had appealed to the Court of Claims after the Bureau's contracting officer had allowed only $44,208, an amount upheld by the Secretary of Interior. The claim court had found the Bureau's action "arbitrary, capricious and grossly erroneous."

In effect, the Supreme Court was ruling upon the finality clause of the standard government form of contract: "Article 15 . . . all disputes concerning questions of fact . . . shall be decided by the contracting officer, subject to written appeal by the contractor within 30 days to the head of the department . . . whose decision shall be final and conclusive. . . . In the meantime the contractor shall diligently proceed with the work as directed." That means what it says, implies the Court, where the dispute concerns only facts and not fraud.

This ruling introduces another hazard into the already hazardous business of public works contracting. It places the contractor entirely at the mercy of the contracting officer. Government specifications are neither perfect nor impartially fair documents. Contractors well know they can be ruined on any job if the contracting officer chooses to enforce the specs to the letter or abuses the prerogatives of judgment allowed him.

The Supreme Court points out that contractors enter into a contract as "a voluntary undertaking on their part. As competent parties they have contracted for the settlement of disputes in an arbitral manner." We take exception here. Certainly, entering into a contract is voluntary on the part of both sides, but the disputed final clause in government specifications does not, it seems to us, permit settlement "in an arbitral manner." Arbitration, as generally understood by construction people, is settlement with the aid of one or more *disinterested* persons, and we don't believe a contracting officer can be regarded as wholly disinterested.

Contractors have in the past willingly undertaken government contracts in the belief that, if the principles of common justice were flouted in prosecution of the contract, relief could be sought from a competent court. But now that right has been denied contractors.

Of course, for the most part, contracting officers are a fine lot—honest, conscientious, and fair. But even honest men have differences of opinion, especially when interpreting vague wording of specifications. But most serious is the fact that now contractors are at the mercy of every government representative who doesn't want to be fair. The dissenting judges are concerned about this, as shown by a few quotations from their opinions:

"Where discretion is absolute, man has always suffered . . . Absolute discretion is a ruthless master. It is more destructive of freedom than any of man's other inventions." "(the rule) makes a tyrant out of every contracting officer. He is granted the power of a tyrant even though he is stubborn, perverse, or captious . . . is incompetent or negligent. He has the power of life and death over a private business even though his decision is grossly erroneous. Power granted is seldom neglected." "He [the contracting officer] is not at liberty to make arbitrary or reckless use of his power, nor to disregard evidence, nor to shield his department from consequences of its own blunders at the expense of the contractors. . . . I still think one should be allowed to have a judicial hearing before his business can be destroyed by administrative action."

It is up to Congress to bring justice back to government contracting. Until it does so, contractors must tread warily in prosecution of public works. They must get as many decisions as possible nailed down in writing before undertaking work where disputes are likely. And now, that malicious phrase "to the satisfaction of the engineer" looms up more of a hazard than ever.

Good luck, fellows, you'll need it!

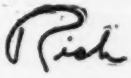
More of the Same

LATEST ADDITION to the confusion emanating from Washington is CPR 105, setting ceiling prices on used equipment. It establishes 55% of factory list price as tops for "as is" equipment, and 85% for guaranteed rebuilts.

Distributors point out that during the last war similar regulations raised the price of junk equipment, instead of controlling it. Furthermore, they object to the 85% for guaranteed rebuilts because the 30% spread between "as is" and guaranteed units is not enough to pay for the overhauling. Then, too, the order demands a 90-day guarantee instead of the industry's customary 30 days. Lastly, freight from factory to point of sale cannot be allowed in compiling the base of current new costs —an item that adds as much as 10% to new machine prices.

Dealers believe 95% of new machine costs up to 2 years old, with freight allowed, and let the market determine the price of junk, is more realistic.

The equipment supply, already critical because of shortage of new machines, is now further disrupted. Construction's vital role today is building for defense. It is already operating under all too many handicaps to do the job the nation so desperately needs. When, oh when will Washington realize that and quit hogtying us with more and more senseless regulations?



WATER JET AND AIR LIFT remove loosened material excavated inside 30-in. pipe caisson for foundation of Beaver River Bridge pier for Pennsylvania Turnpike. Earth ramp from shore simplifies moving of materials, Northwest crane and other equipment to the site.

Earth Ramps and Pontoon Ferry

EARTH - FILLED RAMPS provided a temporary working base for crawler cranes during the construction of two river piers that form part of the substructure of a new 1,540-ft bridge over the Beaver River north of Pittsburgh, a part of the Western Extension of the Pennsylvania Turnpike. The substructure, consisting of six piers and two approach abutments, was built for the Pennsylvania Turnpike Commission by the Contracting Division of Dravo Corp.

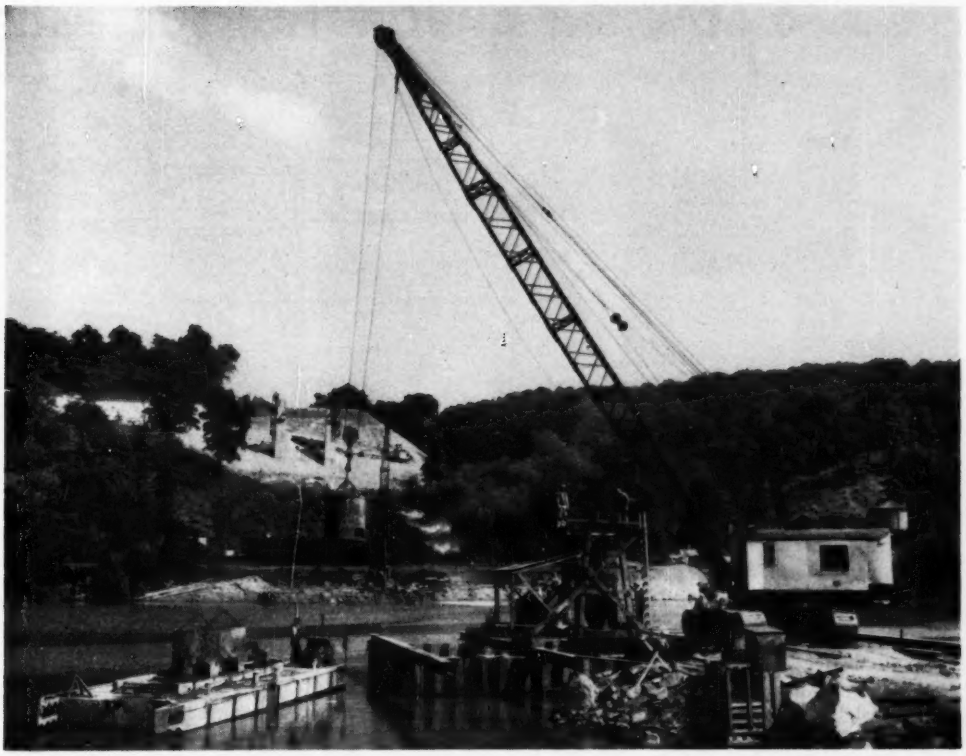
Because the Beaver River is too shallow for floating cranes, the most economical method of getting to the pier sites for construction was to build earth ramps from the shoreline. These provided adequate working space for the land cranes and simplified transfer when their services were needed elsewhere on the job. A total of 7,063 cu yd of fill was placed for the ramps, one on each side of the river. The east ramp was 110 ft long and the west one 50 ft.

A pontoon ferry transported concrete from the project mixing plant to locations on the opposite side of the river. This ferry, 45 ft 7 in. long by 14 ft 4 in. wide, was fabricated at the site from a double string of pontoon cubes. Carrying four concrete buckets in a timber frame, the ferry was moved approximately 500 ft across the river diagonally from the mixing plant by a gasoline engine-driven hoist mounted on the deck. Two cables, a ¾-in. trolley line and a ⅝-in. hoist line were employed.

To facilitate loading concrete into the ferry, the mixing plant was erected over water on a wood-pile foundation along the west bank. A row of steel piling was driven as a retaining wall behind the plant and a slip dredged so the ferry could be loaded with concrete discharging directly from the mixer. The 2-cu yd mixer was built complete with 50-hp motor, charging hoppers, batchers, bins and supporting framework, all of which were transported by rail to the location. Aggregate was railed to the plant and stockpiled by a crawler crane (Linkbelt Model K360) that served concrete-mixing and loading operations.

Piers 3 and 4, the river piers, were founded on 30-in. pipe caissons driven to hard shale. Both piers were built in single-skin box cofferdams approximately 33x77 ft, constructed of sheet piling 43 ft long. To build the coffers, equipment was moved out on the ramp and eight wood piles, capped with timbers, were installed as bracing set supports. Internal cofferdam bracing was framed and set on the supports for use as a template in driving the sheetpiling.

The piling was driven until the



PONTOON FERRY DELIVERS BUCKETS of concrete from batch plant (not shown) to pier under construction. Crane spots buckets over caisson being concreted. Ferry travels 500 ft diagonally across river to also serve river pier under construction in the background.

Help Build Bridge Structure

By R. S. HOWARD
Field Engineer, The Contracting Division
Dravo Corporation

hammer touched the bracing set template which then was lowered to the bottom of the river for the next round of driving. At this point excavation inside the coffer was necessary before lowering the template again. Several repetitions of this series of operations completed driving of the sheetpiles and the coffer excavation.

Before the coffer was unwatered, the 30-in. pipe caissons were driven. Fifteen pipes with special cutting shoes welded to them were used for each pier. Fifty-foot lengths of pipes were driven by a 10B3 McKiernan & Terry pile-hammer (using 115 lb of air) until about 5 ft remained above water. Then 26-ft sections were spliced on with external sleeves, 12 in. deep and connected by continuous welding.

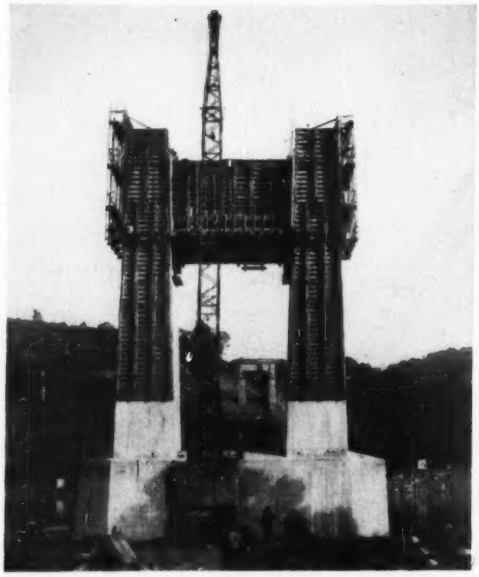
The top bracing set of the cofferdam was used to secure the templates for the pipe caissons. Once hard shale was reached, loose material inside the pipes was removed by a 6-in. air lift and 4-in. water jet. In this arrangement a 6-in. discharge pipe with attached 2-in. air line was inserted in the caisson which had been filled with water.

Then the air, at 112 psi, was turned on to force a steady stream of earth and water out of the 6-in. pipe. When boulders or other large solids were encountered, men with pneumatic air spades and star bits did the excavating and the loosened material was blown out. Obstructions of rock were churned up with a large 4-ton star bit, lowered into the caisson by crane.

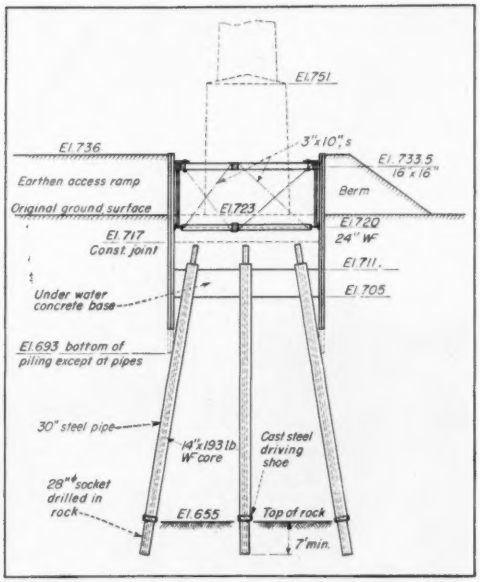
After the driving shoe hit hard shale, a 28-in. "socket" was drilled into the rock about 7 ft deep. In this socket, a wide-flange beam, extending above the cut-off point of the caisson, was seated firmly and grout was poured to fill the socket. This prevented water from leaking into the pipe beneath the cutting shoe or through cracks in the rock. A tremie pipe was used to pour the grout, since water inside the caisson balanced the pressure of water in the rock. When the grout had set, the caisson was pumped dry and concreted.

A tremie seal at least 6 ft thick was placed in the cofferdams after the caissons had been concreted. The piers then were built in forms with the pipe caissons serving as a foundation.

All concrete for both river piers and the east-bank work was ferried from the mixing plant. It took an average of about 45 sec for the pontoon ferry to travel one way diagonally across the river. Con-



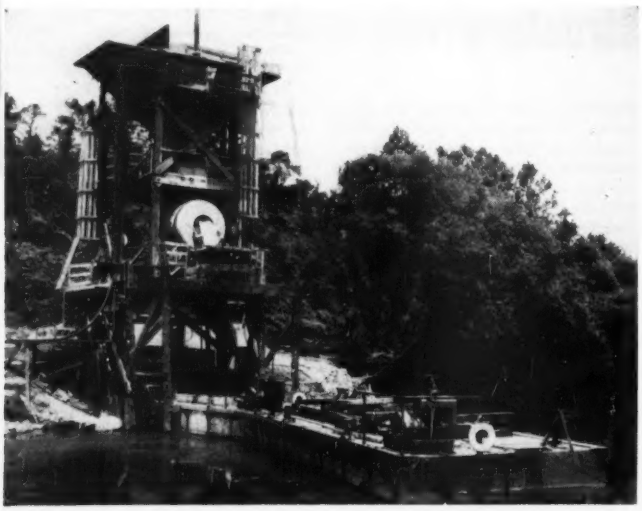
CRANE ON EARTH RAMP at Pier 3 (west side of river) moves up close to assist in handling of forms and materials. Concrete for land piers and abutments was delivered in buckets by flat-bed trucks.



SECTION SKETCH OF PIER 3 of the Beaver River substructure showing earthen access ramp, design of piling and concreted caissons resting on grouted "sockets" in hard shale.

crete buckets for the river piers were lifted off the ferry by the crawler cranes (95 Northwest on Pier 3 and 80D Northwest on Pier 4). Flat-bed trucks transported the buckets from the river bank to the land piers and the abutments. The abutments are founded on 12-in. steel bearing H-beam piles and the land piers are built on solid rock.

The four land piers had to be built on steep slopes, necessitating the construction of roadways to each. On the east side of the river, numerous springs on the hill complicated the problem of drainage.



MIXING PLANT ON THE WEST BANK supplied concrete for all piers and abutments. A small slip was dredged beneath discharge of the 2-yd drum so concrete could be dumped into buckets on ferry. Gas engine-driven hoists mounted on deck pulled the two ferries. Cables used were a ¾-in. trolley line and a ⅝-in. hoist line.

One of Two

The Beaver River Bridge is one of two key bridges on the Pennsylvania Turnpike 67-mi Western Extension from Irwin, near Pittsburgh, to the Ohio border. This entire substructure required about 30,000 cu yd of excavation, 9,000 cu yd of concrete, 383 tons of steel and 1,814 lin ft of 30-in. I.D. steel pipe. The other bridge is a 2,179-ft span over the Allegheny River about 10 mi northeast of Pittsburgh. The substructure of this bridge also was built by the Contracting Division, Dravo Corporation.

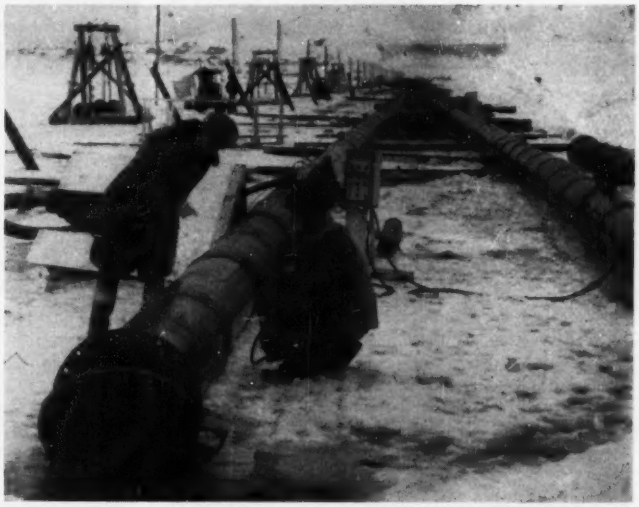
Keep the

SCRAP

Coming Back

CONSTRUCTION 'ROUND THE WORLD . . .

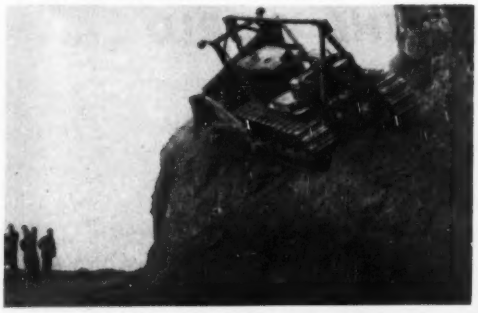
HATSTAND FOR BUCKETS —Britain's Dept. of Scientific and Industrial Research at Barnet, near London, is devoting much attention to studying new construction equipment. This fixture lifts 10 pails of mortar at one time.—Acme photo



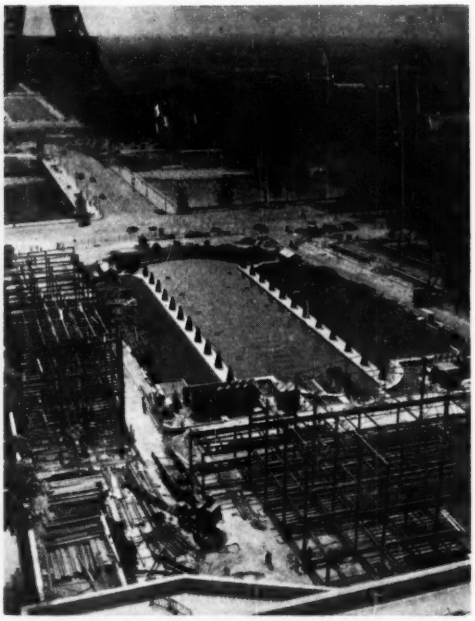
FRIGID CONSTRUCTION — Welder examines a heavy pipeline stretched out over last winter's snow and ice along the Volga River in Sovietland. Picture has just been released by Sovfoto, Russian picture outlet in New York, and it is claimed that the 3,000-ft pipe now is on the bottom of the Volga at the construction site of the Kuibyshev Power Project. It is designed to transport sand to be used as fill for the future construction of the hydro-electric station. As usual, Reds supplied no details.

DUTCH DIKE — Continuing their unrelenting battle against the sea—and following a plan of progressive reclamation of land now under water—construction workers in Holland here are finishing off another dike. A stable barrier is built by laying down woven willow mattresses. These are floated and towed to the construction site, where they are weighted and sunk to the bottom with rocks. Sand is pumped on the top and is reinforced by a sand-asphalt mix. The dike is reinforced by successive layers of mattresses. Here is a crew putting down an 8-in. layer of 20% asphalt mixed with sand for a final coat. Note the side-dump truck delivering the asphaltic mix and in the foreground appears to be a portable, gas-engine-driven electric plant.—Eastern Publishers photo

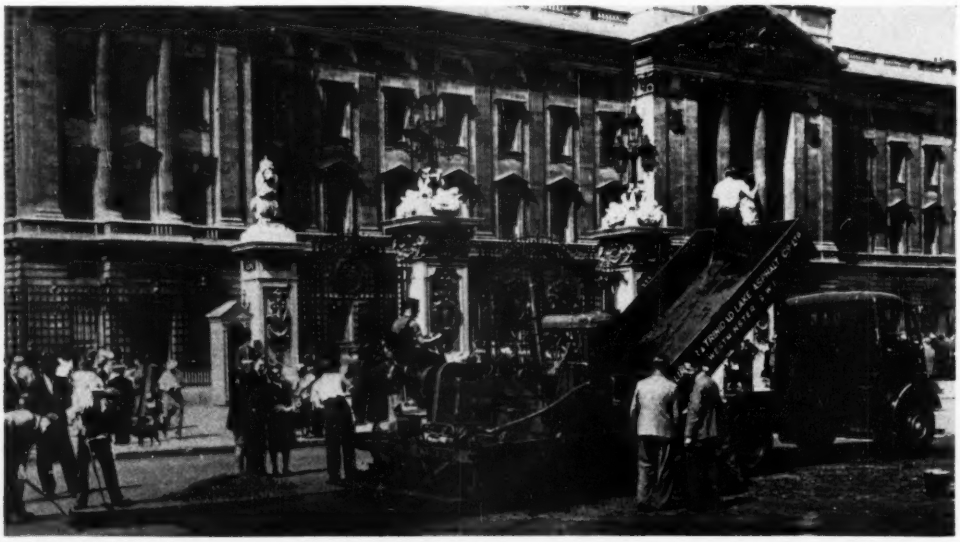
(Continued on page 50)



TOPPLED — Top: Caterpillar D7 in khaki with the Army in Korea teeters on the edge of a bank after ground gave way under left tread as engineers worked to open a pass on the east central front. Tank retriever was employed to pull crawler back to safety but the tow cable snapped and the bulldozer then rolled over (bottom). No one was injured.—Wide World photos



FOR INTERNATIONAL ASSEMBLY — Truck is delivering steel, and cranes handle and hoist structural members into place for framework of the conference rooms and the building that will house the secretariat of the United Nations sixth General Assembly in Paris next month. Construction is in Palais de Chaillot area.—Eastern Publishers Service photo



FIT FOR A KING — A Coldstream Guard stares straight ahead as red asphalt is laid in front of King George VI's Buckingham Palace on London's famous Mall. A Barber-Greene-Olding Finisher, manufactured in the English plant of B-G, is doing the work. Mall is being resurfaced with a mixture of red granite and limestone dust, blended with a red-pigmented asphalt. Resulting mat is a dark brick red. New pavement replaces an ancient wood-block pavement which was removed completely. Limmer & Trinidad Lake Asphalt Co., Ltd., was the contractor on this job which was followed by the citizens of London through elaborate newspaper and radio coverage. Contractor operates 18 Barber-Greene finishers, is one of largest paving concerns in England.

What Can I Do About Safety?

...Ten Workable Suggestions From One Contractor to Another

By JOHN A. VOLPE

4. Install Safety Program on a Competitive Basis

MANY OF US are aware of the need for a continuing safety program, but some of our employees must be sold on the idea that *safety pays off*.

The creation of a program which provides for awards on a competitive basis gives that additional incentive needed by some construction personnel to make them eager participants in safety work.

Here is what we have done to promote this spirit:

- **Set up a system of awards** to key personnel which is financially profitable to the individual and which gives him the feeling of satisfaction over winning something. All of us like to be wnners and it is no different in a safety contest.
- **Initiate a direct contest** among the superintendents employed on your projects, on a monthly basis. (We have developed a competition whereby each month the superintendent with the best safety record gets an award of $25.)
- **The superintendent with the best quarterly record** is given an award of $50.
- **The superintendent with the best annual record** is given an award of $100.
- **Most of our projects** operate without lost-time accidents so that an award of $10 is given to each superintendent whose project operates without a lost-time accident during the month.
- **On our average operations** a contest is developed among the trade groups on each project. The basic trades employed by us are carpenters, laborers and bricklayers. The contest among these groups is instituted so that each month the foreman of the trade group that develops the best record is given an award of $10.
- **The foreman with the best quarterly record** is given an award of $25.
- **The foreman with the best annual record** is given an award of $50.
- **Foremen who have no lost-time accidents** in their gang are awarded $5 each month.
- **On large-scale projects** where several superintendents and foremen are required, an inter-project competition is developed among these supervisors. All superintendents and foremen who have no lost-time accidents are rewarded.

Awards are distributed at a monthly dinner safety meeting to which all of the superintendents

"Awards are distributed at a dinner safety meeting to which all the superintendents and foremen are invited, with the boss making the presentations."

and foremen are invited, with the "boss" making the presentations. Whenever possible, this is publicized in the press.

A good speaker is provided or a motion picture shown at each of these meetings, all building up good will among the supervisory force. This pays off not only safety-wise but in good morale.

5. Indoctrination of the New Employee

Safe workers are not necessarily good workers, but the fact that a good worker is a safe worker has been proved time and time again.

A construction outfit working together with a minimum of accidents produces more than a similar group that is "accident ridden."

Indoctrination of new employees is an important phase in making

The author discussed the first three of his suggestions in the December issue of Construction Methods and Equipment. Herewith are suggestions 4, 5, 6, and 7. The final three will appear in next month's issue.

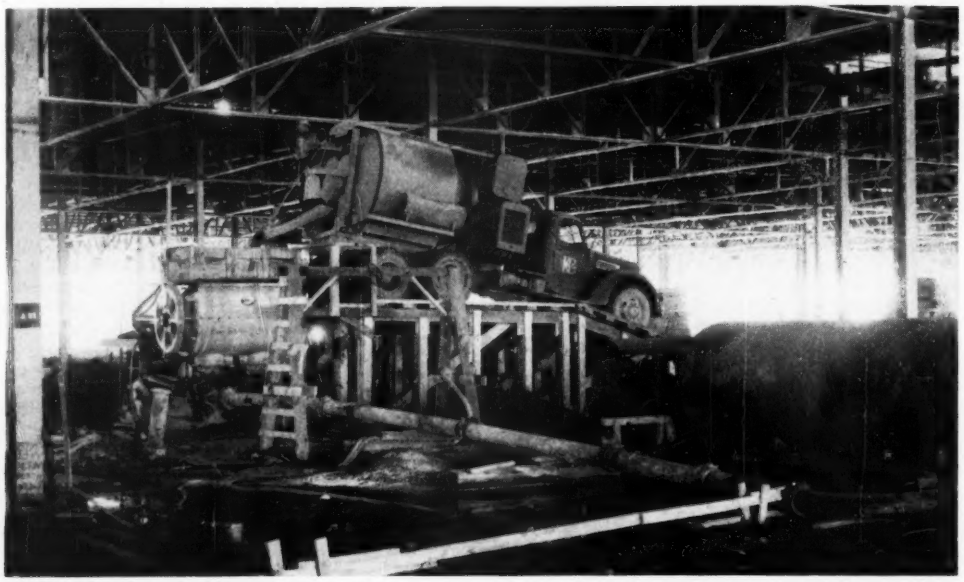
safe workers, particularly in the construction industry that is almost constantly employing new personnel. Jobs are performed in locations which may be entirely new to the contractor. This means a constant flow of new employees who must be indoctrinated.

- **Each new employee should know** first of all that he is now employed by a firm which holds safety to be of primary importance on the job. The supervisor who hires the new man should immediately impress him with this thought.
- **A letter should welcome him** to the project and tell him about the safety program. Induce him to become a safe worker on the team so that both he and his family will not suffer as a result of an accident.
- **Each man should be questioned** as to his previous work record and, wherever possible, placed on an operation with which he is familiar. He should not be placed on a high staging, for instance, if he has a fear of working in the air.
- **Each man should be taught** to do his job safely. The foreman should check with him to make sure that he knows how to perform the task to which he is assigned, in a *safe* manner.
- **He should be made familiar** with the general safety policies and the necessity for good housekeeping on the job. He should be impressed with the part that he must play in helping to maintain a clean job as well as a safe job.
- **He should be warned** to report even the smallest injury immediately for first aid treatment. The neglect of a small scratch may be a short cut to infection.
- **He should be reminded** that all unsafe conditions around his area which he cannot personally correct, should be reported to his foreman so that they can be corrected.
- **He should be told** of the firm's participation in accident preven-

(Continued on page 102)

WHEELED JUMBO supports elevated discharge line from Pumpcrete machine to pave wide area of Delaware factory floor. Contractor, H. K. Ferguson Co., built simple time- and labor-saving rig from salvaged pipe, steel channels and old automobile wheels.

Raised Discharge Paves 40-Ft Swath With Concrete Pumped to 21-Acre Floor Slab



TRANSIT-MIX CONCRETE is fed to Pumpcrete machine from raised timber structure. The bolted 14-ft platform and 20-ft ramp, both 14 ft wide, are decked with 3x10s on four lines of 6x8-in. stringers supported by 6x6 posts on 3½-ft centers both ways.

IT TAKES A LOT of concrete—22,000 cu yd or so—to pave an 8-in. floor slab covering 21 acres. And while you can't often reduce the material quantities, you can cut placing time and costs way down. Here's how H. K. Ferguson Co. is doing it at a new plant it's building for Chrysler Corp. at Newark, Del.

One Pumpcrete machine is handling all 22,000 cu yd of floor-slab concrete. By mounting the discharge end of the delivery pipeline high up on a wheeled jumbo, pours 40 ft wide are being concreted in a single pass. This, plus a well-organized procedure for handling and cleaning pipe, is netting 1,800 to 2,200 sq yd of 8-in. floor slab daily.

Chrysler's new plant will produce Army tanks. For this it needs a super-strong floor slab (3,000-lb concrete 8 in. thick; ⅝-in. reinforcing bars on 12-in. centers both ways, top and bottom; 3-in. wood block surfacing) and lots of space (900,000 sq ft on one floor of one building). Plant bays are 40 ft wide. And floor pours are made full bay width and generally 400 to 500 ft long so they can be completed comfortably in one 8-hr shift.

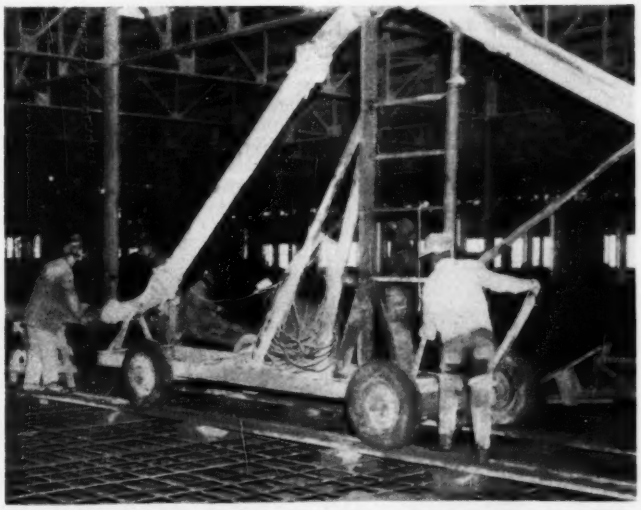
Only One Setup

The Pumpcrete machine—a Rex 200-Double—is placed near the center of the 600x1,500-ft structure to hold maximum pumping distance to less than 1,200 ft. It pours the entire floor from this one setup, having had to be turned only once, through 180 deg, to avoid a U-bend in the pipeline after half the slab had been completed.

A fleet of five 4-yd Jaeger and Rex transit mixers on International and White trucks delivers concrete to the machine. They haul 1,300 ft from the job's Johnson batch plant, which is set up alongside a new permanent rail spur into the factory grounds. In the building, mixer trucks back up a heavy timber ramp to discharge into the Pumpcrete re-mix hopper whose sides have been built up 24 in. to hold an enlarged batch.

From the Pumpcrete, the mix goes to the pour through an 8½-in. pipeline supported on timber horses 3½ ft high. A riser-pipe jumbo, or dolly, carries the discharge end of the line, elevating it some 12 ft in the air so the concrete can be chuted over the entire 40-ft width of pour.

FLAP GATE at midpoint of 20-ft chute helps distribute concrete evenly. Partly visible on centerline of pour, between jumbo's wheels, is T-bar screed guide supported on slotted 2x2-in. stakes so 40-ft pour can be easily screeded in two 20-ft widths.



SHORTENING PIPELINE as pour advances is simple matter of removing two 10-ft lengths and backing jumbo for new connection. Wheeled rig rides on plank tracks, rolls easily.

The jumbo's pneumatic-tired wheels ride sectional timber runways on a 3-ft gage. Runways are 10-ft lengths of 2x12 planking fitted with wooden lip curbs and supported on blocking to subgrade. Five lengths of runway are provided for each wheel line so sections can be leapfrogged back as the pour advances.

Supported from the front of the jumbo is a pivoted 20-ft chute that

CONCRETE MIX
(per cu yd)

Cement	545 lb
Sand	1,215 lb
Gravel	1,975 lb
Water	30 gal

PIPE SECTIONS are cleaned as soon as they are removed from the line, then will be coupled into position for next day's pour. In foreground is job-built squeegee for pipes' final swabbing; at left are blocking and tracks to be set for next move of jumbo.

can be swung easily through more than 300 deg to direct concrete over a wide area. Halfway down, the chute is fitted with a simple flap gate to help distribute the mix closer around the jumbo. The hinge is at gate midpoint for quick opening and closing with little pressure.

As the face of the pour moves back toward the Pumpcrete machine, the concrete-delivery line is periodically shortened by removing two 10-ft pipe lengths directly behind the jumbo. The pump needs to be stopped only a minute or so while the three joints are broken, two pipe lengths and their supporting horses taken out, and the jumbo pushed back 20 ft to have its discharge pipe re-connected to the main line.

The two sections of pipe removed at each jump are cleaned immediately. They are rested slantwise across two horses of unequal height while they are flushed out with water, then swabbed with a squeegee—an 8-in. circular plate of ¼-in. steel fitted with a peripheral rubber gasket and fastened to the end of a long 1-in. pipe. As soon as they are cleaned, Pumpcrete pipes are carried directly across to the adjacent bay where they are coupled into the line for the next slab section. Thus, upon completion of one day's pour, the pipeline is already set up for the next one, and with a minimum of effort.

To clean the pipeline still remaining between Pumpcrete machine and slab at the end of a day's run, Ferguson has borrowed a trick from tunnel Pumpcreting procedure. Two or three go-devils with burlap wadding between them are put in the machine-end of the pipe and forced through by water. When concrete has been pushed out and the go-devils appear at the elevated discharge atop the jumbo, the water is turned off and the go-devils are reversed in the pipe.

A blow-head is then fitted to this end of the water-filled line and the go-devils blown back to the Pumpcrete machine by air from a LeRoi 105-cfm compressor. Wash water pushed ahead and out of the pipe is directed by hose into a sewer manhole at the concrete pump. This neat procedure eliminates the messy problem of disposing of as much as 2,000 gal of water daily in the vicinity of the newly poured slab.

Water for washing the pipeline comes from a domestic supply, with pressure stepped up to 500 psi

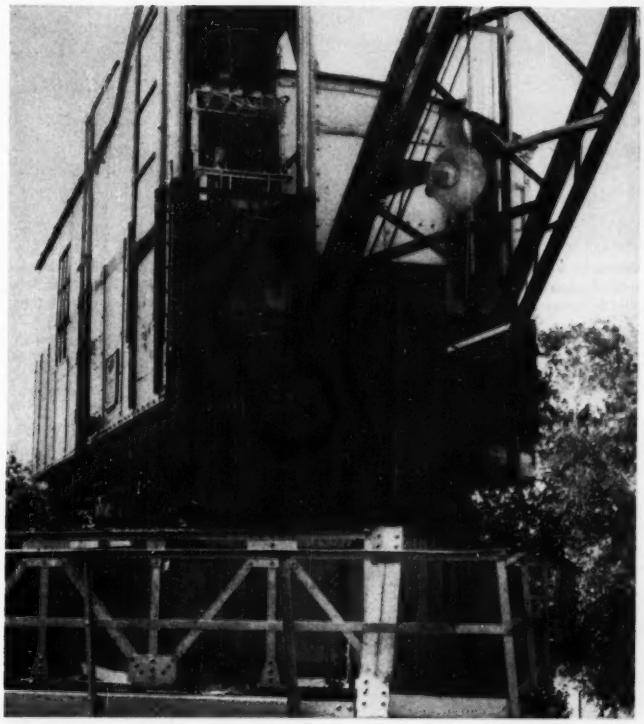
HAND SCREED smooths slab concrete, after which it will be wood floated and belted, then sealed with an asphalt-base Kreolite curing compound sprayed on 8 hr later. Subgrade, of course, is wetted before pour. Wood block flooring will complete the job.

by a CH&E triplex high-pressure pump alongside the Pumpcrete machine. Water service is frequently interrupted, so Ferguson keeps an adjacent 2,000-gal tank filled on standby for use in emergencies.

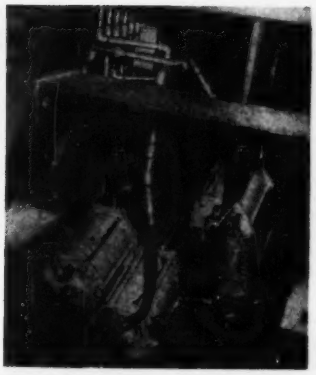
Between 400 and 500 lin ft of 40-ft slab (1,800-2,000 sq yd) are poured in an 8-hr day, calling for 400 to 500 cu yd of concrete. The paving crew consists of 20 men: one oiler and one operating engineer on the Pumpcrete machine; four laborers and a foreman on the pipeline; seven laborers spreading and screeding concrete; five men and a foreman on finishing.

Top man for H. K. Ferguson Co. on the Chrysler Tank Plant is Elmer G. Senior, general superintendent. Al Mourtsen is his grading super and Tom Campbell is superintendent on the slab Pumpcreting. Irving J. Minnett is plant engineer in charge of the project for Chrysler, and Richard L. Jones is Chrysler's construction engineer. The architect is Albert Kahn Associates, with Fred Guenot serving as field superintendent.

Pneumatic Controls Ease Crane Operator's Job



OLD WHIRLER CRANE on 30-ft gantry, an electrically driven Dravo rig with 70-ft boom rated 15 tons at 35 ft, is fitted with brand new air controls for easier operation. System includes seven operating controls, automatic safety controls, and small air compressor.



NEW CYLINDERS and air lines that actuate brakes and clutches take up little space, can be placed almost anywhere.

AIR DOES THE HARD WORK for the operator of Southern Materials Co.'s 20-yr-old gantry crane at Richmond, Va. Air-powered actuators replace a mechanical lever system to apply clutches and brakes for swing, boom and bucket lines.

The new Westinghouse Air Brake controls were installed when the regular operator, a big man of exceptional strength, became ill and substitutes of less weight and muscle could not handle the rig satisfactorily. Formerly operated by a man standing, his full weight required on pedals and levers, the crane is now run easily by a seated operator. Maximum force on all pneumatic controls is only 10 lb.

A 5-hp compressor delivers 80-lb air to the actuators. On operating controls, an 8-psi back pressure returns levers and pedals. On foot-operated holding and closing line brakes, a 5-psi preload gives instant action and minimizes friction in rigging and cylinders. These adjustments give the operator a better sense of feel, with more accurate crane work. For safety, brakes go on automatically when air pressure drops below 50 psi.

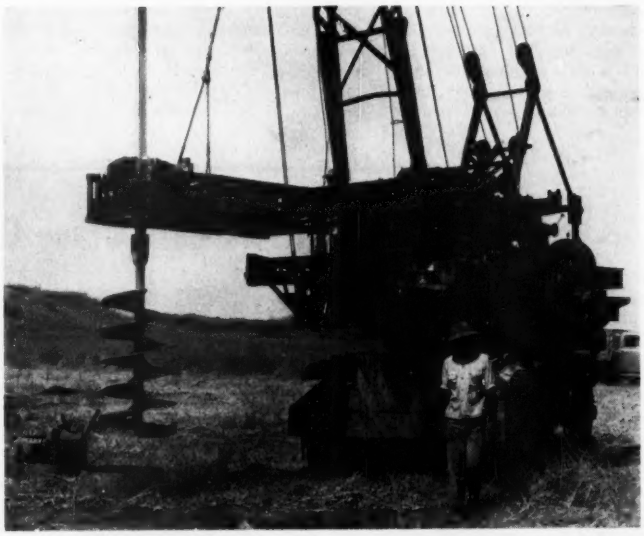
Drilled Foundation Holes Save

FOUNDATION WORK on structures for Houston's Gulf Freeway has been speeded and done more economically by drilling holes with an earth auger for concrete supporting columns which are poured as much as 40 ft deep.

For instance, pile-driven bridge footings are eliminated by the construction of reinforced concrete columns, poured-in-place and with under-reamed spread footings. On overpass type bridge structures the earth-boring method has saved 50% on foundation costs and made it possible to complete this part of the freeway job in a fraction of the time required for pile foundations.

Hole-boring for foundations is not unusual in the Southwest. (See CM&E, July 1948, p. 74, for a similar application.) Jack Watson of Fort Worth, Tex., who started out as a house-mover, has designed and built his own boring and foundation equipment. Within the last 12 yr, he has developed his technique into what he calls a science that reduces costs on foundations and adds to the stability of structures built upon soils of varying formations.

On the Houston job, Watson used a company-built, gas-engine-driven, vertical rotary rig, which hoists a 4,000-lb 40-ft kelly joint. A 30-in. dia soil auger at the lower end of the kelly joint bores holes in almost any kind of material, at the rate of 1 fpm. As it bores, it packs earth between the spirals; then it is raised by the rig operator, who swings it to one side and removes the spoil by rapidly revolving the auger.

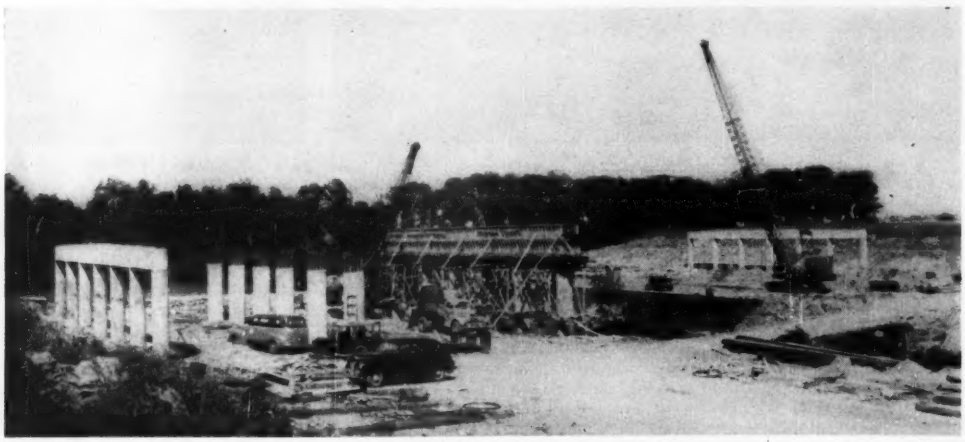


WATSON VERTICAL BORING OUTFIT lowers 30-in. soil auger to begin hole for construction of reinforced concrete supporting column for Houston Gulf Freeway. Forty-foot kelly joint is driven by custom-built rig on truck. Steel collar on ground guides auger at start.

After specified depth has been reached, an under-reaming tool, also built by the Watson shops in Fort Worth, is attached to the kelly joint and lowered to the bottom of the shaft, where its flared-out wings spread gradually to cut a bell-shaped bottom. The footings usually are belled to three times the diameter of the drilled shaft.

When working uncertain soils containing caving material, it is necessary to insert a steel casing to fit the diameter of the hole and almost as long as the hole is deep. This is removed as concrete is poured.

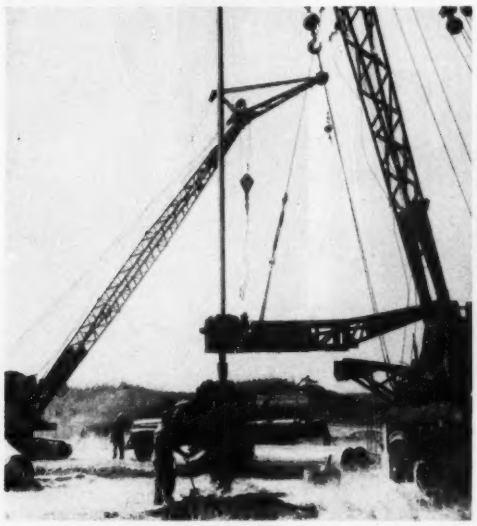
On the Hampton-Inwood Bridge,



GENERAL VIEW OF SITE shows how foundation columns are continued above ground and tied together into piers. When a hole has been drilled and cleaned out—usually taking about 1½ hr—a mat of reinforcing steel is lowered into the hole before concreting.

Time and Money

By EDWARD F. LONDON



AUGER LIFTS LOOSENED EARTH from shaft to spoil pile. Koehring crane handles reinforcing steel and casings needed. Ford tank-truck hauls water to wash casings and cure concrete.

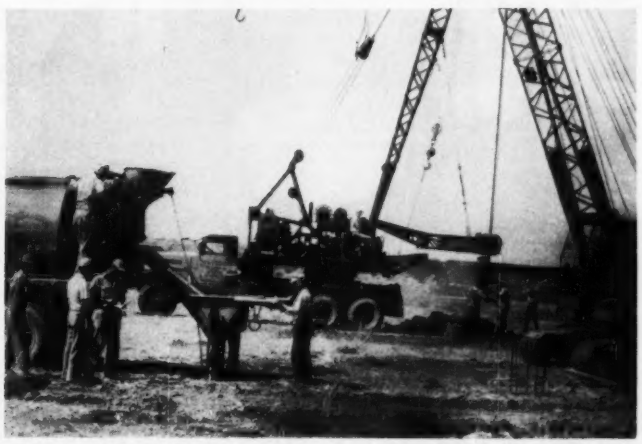
UNDER-REAMING TOOL, built by Watson, has side-flange cutters which open at the bottom of the shaft and bell out the 30-in. hole to about 90 in. for an increased footing area.

now being built over the Trinity River in Dallas County, Tex., Watson is performing foundation work similar to that of the Houston job, with the exception that the footings are not under-reamed.

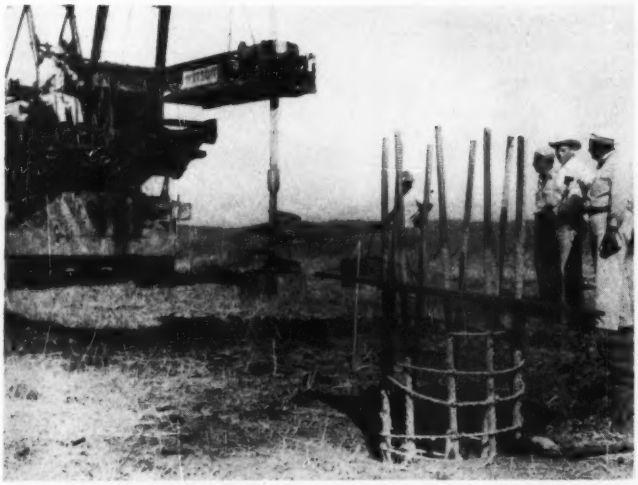
Here, the holes are bored with the same type of soil auger to a depth sufficient to loosen the soil in the upper stratum. Then a steel casing the same diameter as the hole, and with a toothed bottom edge, is twisted down by the kelly joint through the water table approximately 12 ft below ground level to stable bearing material—in this case blue shale.

Water-saturated soil is removed with a special bucket, also designed and built in the Watson shops. This bucket has a trap door on the bottom, which automatically opens when dumped, and is closed when the rig operator drops it to the ground. The upper edge of the clean-out bucket has been rim-cut and bent inward so that it will not

LOOKING UP from bottom of shaft is worker who mucks out bell bottom after under-reaming.



TRANSIT-MIX CONCRETE is poured into finished hole through sheet metal tremie pipe 10 ft long while boring rig in background drills another hole. Reinforcing rods at right mark poured shaft.



SHAFT HAS BEEN POURED to within 1 ft of surface. Wooden disk with holes strips over reinforcing bars to keep sun off fresh concrete. Column later is extended upward to pier height by welding on more reinforcing steel, building a form and pouring concrete.

CASING HAS TOOTHED BOTTOM EDGE which cuts into soil through water table. It is pulled out as concrete is poured.

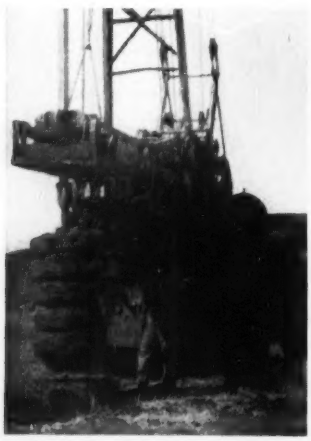
catch on the casing when drawn out.

Twelve holes were drilled daily when this job was started. But the going became rougher when granite or blue conglomerate was encountered, slowing production to seven holes per day. To break through the granite, which runs from 10 in. to 2 ft thick on this job, the 4,000-lb kelly joint is dropped full length of the hole with shattering impact.

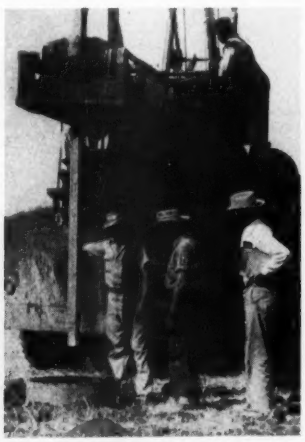
After the granite has been punctured, the soil auger is replaced on the kelly joint for further boring, and another stratum of water-saturated sand and gravel is removed. The steel casing is lowered until firm shale is reached, in which the auger bores about 6 ft below the end of the casing. On this job, the shale is from 50 to 200 ft in depth and, according to Watson, is stable foundation material, making under-reaming unnecessary.

To observe progress made and the condition of a bored shaft, the crew used reflected light from a hand-held mirror to focus on the side and bottom of the shaft, running from 25 to 48 ft deep on this job. Specified depth is ascertained with the aid of a weighted tape measure.

When the hole has been drilled and cleaned out, usually taking about 1½ hr, a circular mat of reinforcing steel, made of ten 1-in.



BLUE SHALE ON AUGER comes up as compact load. In soil of this type hole is not under-reamed; material makes good footing for concrete column.



GRANITE STRATA ARE BROKEN through by dropping 4,000-lb kelly joint the full length of the hole for a shattering impact. Auger removes spoil.

EXCESS WATER AND MUD are excavated by Watson-designed bucket which has a trap door on the bottom that opens and closes automatically.

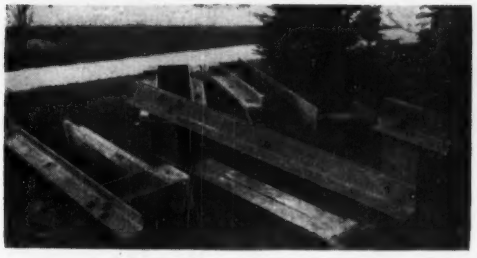
steel rods, is lowered into the hole by a crane.

Transit-mix concrete (3,000 psi) is poured through a tremie extending into the hole about 10 ft. The tremie is a sheet-metal spout with the upper part flared out to catch the concrete without waste. As the concrete pours, the casing is withdrawn gradually from the hole.

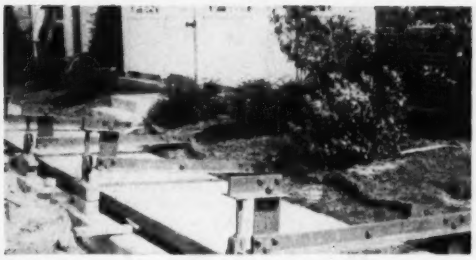
The shaft usually is filled with concrete to within a foot of ground level, with the reinforcing rods extending above the surface about 18 in. Later, the pier is extended upward to specification height by tying in another section of reinforcing steel to the underground rods, building a form and pouring concrete. This part of the work is done by the general contractor on most jobs.

"There is a big difference between just getting holes in the ground, and getting good footings," says Jack Watson. He states that training and experience are of vital importance in acquiring the feel that lets a good driller know when the bored shaft is just right.

Job-Built Lifters Salvage Sidewalk



1 SIDEWALK LIFTERS made of angle iron and a section of H-beam—bolted and welded—with a jack arm to span the slab and a shorter leg to slip underneath and do the lifting.



2 RATCHET JACKS are set on top of the curb under the inverted pads of the jack arms. Raised evenly, set of lifters brings up a 20-ft slab with ease, creates desired opening.

3 WORKMEN HAVE RAISED a section of walk and now are shoveling in sand to form an extra cushion and supply the exact elevation desired. Note untreated sunken section in foreground.

4 RAISED SIDEWALK is as good as new at a mere fraction of the cost of breaking up sagged sections and pouring fresh concrete. Walk has been leveled and front edge raised.

ALTHOUGH Fred G. Rockwood of Madison, Wis., retired from the construction business several years ago, he has not lost his interest in dreaming up and building handy tools to fit specific needs.

Only recently he devised a sidewalk lifter, built of angle iron and operated by an ordinary jack, that makes it possible to lift sunken concrete slabs, put fill under them and bring them back to grade.

Rockwood built four such lifters when he was confronted with several hundred feet of sagging sidewalk around the court of a garden apartment.

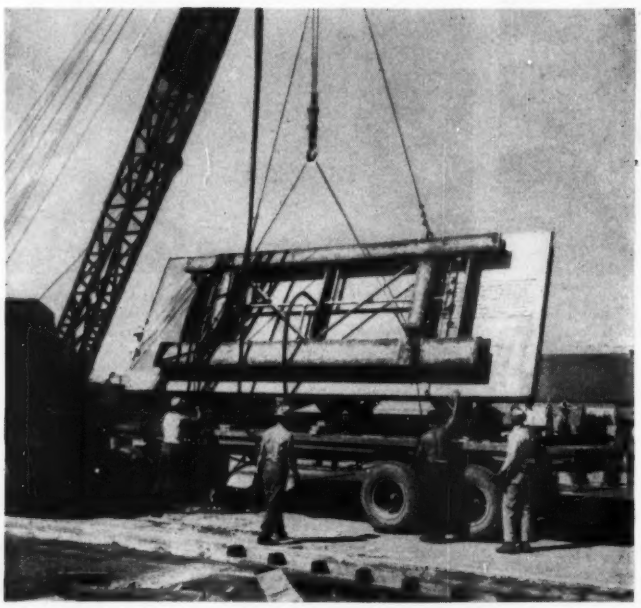
The jack arm of the lifter spans the width of the concrete slab completely. Attached to one end is an 8- or 10-in. riser welded at the bottom to an angle iron leg somewhat shorter than the jack arm. The jack arm is provided with a raised, inverted pad to receive an ordinary automobile jack.

In use, lifters are positioned along a slab by pushing the leg across underneath the concrete. The lifters are elevated evenly by the jacks and in so doing raise the forward edge of the pavement. The amount of lift can be regulated for an ample opening to place sand or other fill to bring the slab up to proper level.

Four lifters raise a 20-ft section with ease and Rockwood reports salvage of 95% of the walks where the machines were used. Many towns and villages particularly should find this method desirable —in preference to breaking up sagging sidewalk sections and reconcreting the area.

Houses Go Up Fast With . . .

Precast Sandwich-Type Concrete Walls

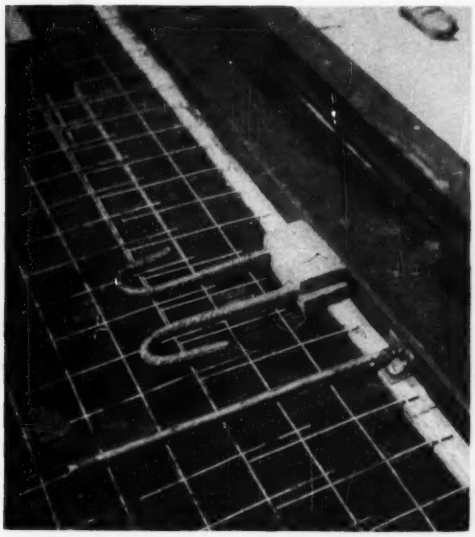


COMPLETE WALL PANEL is lifted from casting bed by a Lorain crane mounting a vacuum pad. Panels weigh from 6 to 7 tons and are tilted after leaving the forms so they can be leaned against center "A" frames on truck-trailers which carry two panels apiece. (Photos by Portland Cement Assn. and Pittsburgh Corning Corp.)

ASSEMBLY-LINE PRODUCTION of prefabricated, sandwich-type concrete wall panels—with cellular-glass insulation—is providing 1,000 dwelling units quickly and at lower costs for naval and civilian personnel stationed at the Naval Training Station, Great Lakes, Ill.

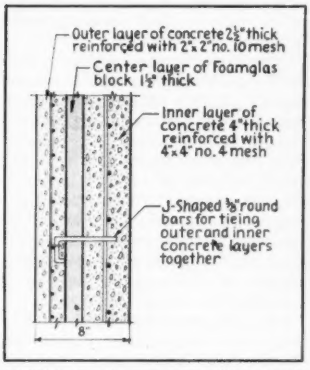
Exterior walls of the houses are of the insulated sandwich type. They are 8 in. thick over-all, consisting of a 4-in. inner concrete layer separated from a 2½-in. outter concrete layer by 1½ in. of Foamglas. The 4-in. inner layer becomes the load-bearing face of the wall after erection. Foamglas—a cellular-glass product of the Pittsburgh Corning Corp.—not only serves as an insulating material but also as an excellent vapor seal. The three layers of the wall are held together by steel ties in the form of J-shaped bars, strips of welded wire mesh or expanded metal.

These exterior walls, as well as the 6-in. solid party walls, are cast flat at a centrally located casting yard on the site. After moist-curing for two or three days, they are lifted by a crane with a vacuum pad on to a truck for transportation to the building site where they



LIFTING HOOKS and welding lugs are positioned along with 4x4-in. reinforcing mesh before inner 4-in. layer is poured. Scraps of Foamglas at form keep concrete off hook for later lifting.

FOAMGLAS INSULATION BLOCKS are laid and shear ties pushed into concrete between blocks while material is still plastic. Ties used here are strips of 4x4-in. No. 9 wire mesh, 4 in. wide.


Outer layer of concrete 2½" thick reinforced with 2"x 2" no. 10 mesh
Center layer of Foamglas block 1½" thick
Inner layer of concrete 4" thick reinforced with 4"x 4" no. 4 mesh
J-Shaped ⅜" round bars for tieing outer and inner concrete layers together
8"

SKETCH of wall cross-section illustrates its three-layer, sandwich-type construction.

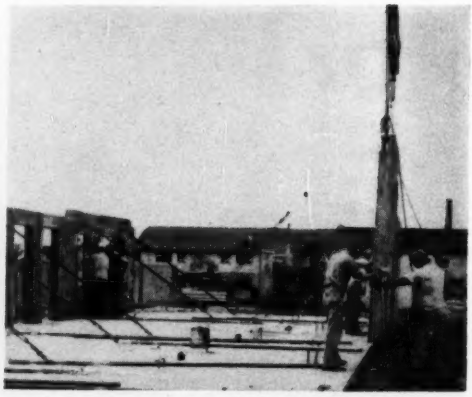
POURING OF SECOND LAYER begins as soon as Foamglas, wire ties and 2x2-in. mesh have been placed. Panel dimensions are varied by inner form blocks.

are set into position by another crane.

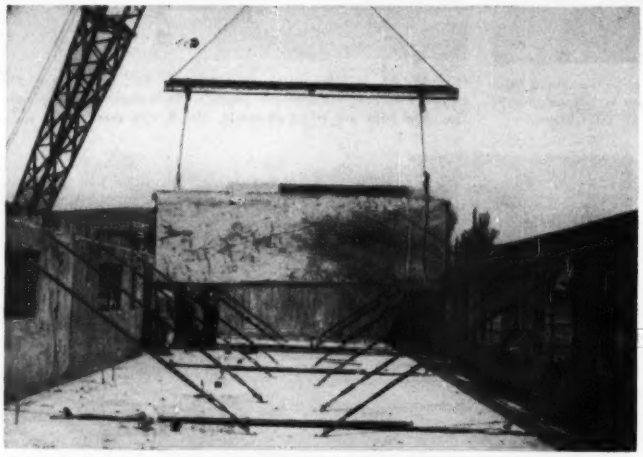
Exterior wall-sections are set on the foundation in a mortar bed and braced temporarily. They are then permanently welded together along steel welding plates cast into the sections along the top of the wall. Flexicore floor and roof slabs (precast hollow-core concrete slabs) are then set in place on the walls. The ends of the roof slabs are welded to the top of the wall sections by means of welding plates. Small steel plates that have been imbedded in the wall-sections and which coincide with similar plates

SURFACE FINISHING of the outer side of the wall is done by a stiff broom to give a rough texture. Around doors and windows the concrete is troweled smoothly. Panels are covered with waterproof paper and kept moist for at least two days.

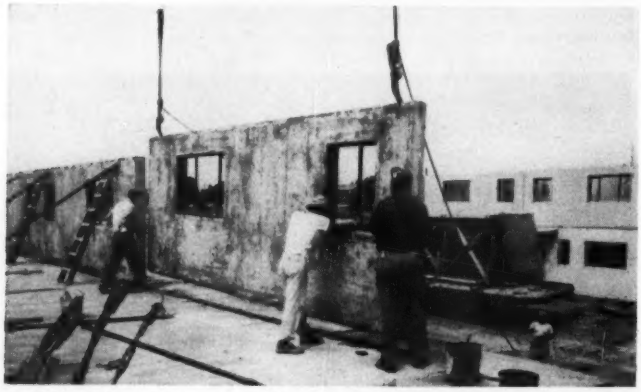
FOUNDATION WALLS and footings are cast integrally. Inner face is vertical, outer face sloping. Walls are 3 ft deep, 8 in. wide at top and 16 in. wide at base. Inside perimeter is insulated.



MORTAR BED ON FOUNDATION makes seal for wall-sections as they are set by a crane and braced temporarily to floor slab. Floor has 4 in. of concrete; 8 in. along edges.



PARTY WALL of 6-in. solid concrete is lowered into place. Small steel plates imbedded in the wall-sections are welded to similar plates in the floor slabs, for a permanent fastening.



SECOND-STORY WALL is set into place. Joints between wall-sections are filled with an insulating material and outside of joints calked. Note A-frame on trailer in background.

in the precast floor slabs are welded together. After welding is completed, the wall braces are removed.

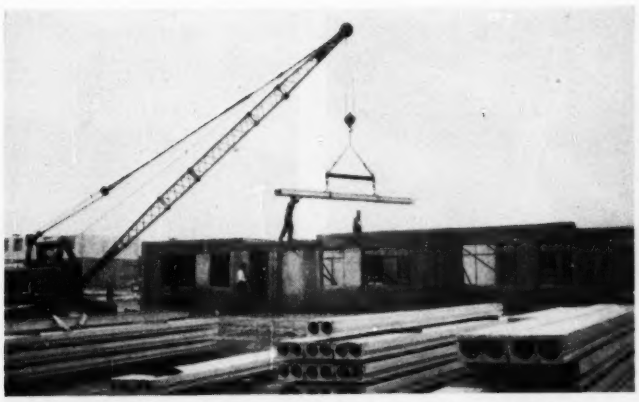
All joints between wall-sections are filled with an insulating concrete material, and the outside of the joint sealed against weather with oakum and calking compound.

The all-concrete housing project will provide one- and two-story dwelling units that include apartments, row houses, duplexes, and single family units. The project will cost about $9,000,000 including garage facilities for 350 cars. Intended primarily for naval personnel, both enlisted and officer, the first 35 units were ready for occupancy by the middle of last October. The remainder are to be occupied this year.

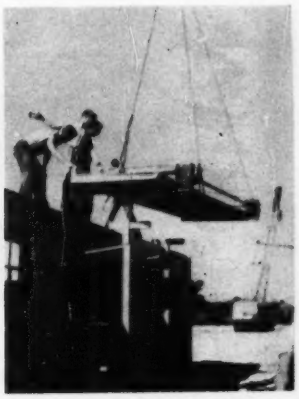
The project, called Forrestal Village, is authorized under the Wherry Act and is being financed in part by three FHA-insured loans. Sponsor and builder (who will manage and maintain, too) is Corbetta-Price Co., Inc., a joint venture of Corbetta Construction Co., New York and Price Brothers Pipe and Construction Co., Dayton, Ohio.

Prefabrication of wall-sections takes place on concrete casting beds 10 ft wide and approximately 300 ft long. This arrangement makes possible the efficient use of lifting cranes, fabrication crews, and ready-mix trucks which supply the concrete. Wall-sections for four dwelling units are constructed per day on these casting beds.

Because an exceptionally smooth inside wall surface is desired, walls are cast on plastic-surfaced ply-



FLEXICORE CONCRETE SLABS are used for second-floor and roof "planks." Unit crane places them and joints between slabs are grouted. Floor slabs are smoothed for asphalt tile. Roof slabs get 1½-in. Fiberglas insulation and conventional membrane roofing with gravel top. Floor slabs are 24 ft long; roof units 28 ft, to give roof overhang.



PORCH CANOPY of solid, cantilever type is lifted into position over twin entrances. Hollow cores in second-floor Flexicore slabs become heating ducts.

wood panels, the surface against the plywood becoming the inner surface of the wall. Edge forms are bolted to the plywood panels and concrete bed, and may be removed readily after the wall has hardened sufficiently.

Divider boards placed at right angles to the edge forms separate the long casting beds into a series of individual wall forms. Forms are sprayed with form oil, and then window and door frames, conduit, welding plates, lifting hooks and sheets of 4x4-in. No. 4 gage mesh reinforcement for the lower layer of concrete are placed.

The lower 4-in. layer of concrete is poured and vibrated. Blocks of Foamglas insulation, 12x18x1½ in. are laid over the concrete while it is still plastic. Steel ties then are placed. One type consists of J-shaped bars, 6 in. long, thrust through the Foamglas insulation to bond the lower and upper wall layers together. Another is a 4-in. wide strip of 4x4-in. No. 4 gage steel mesh inserted at regular intervals between the cellular-glass insulation to tie the lower and upper wall layers together.

The upper 2½-in. layer of concrete is poured immediately after ties have been installed. This layer is reinforced with sheets of 2x2-in. No. 10 gage mesh reinforcement. Concrete for both layers is made from a 6¾-bag mix with pea gravel as the aggregate, and is designed to have a compressive strength of 4,000 psi at 28 days. All concrete used on the project is transit-mixed.

To lend variety to the exterior appearance of the walls, the surface of the upper (outer) layer of concrete is finished by several different techniques. Around doors and windows, the concrete is troweled smoothly. The rest of the wall is given a rough-textured finish with stiff brooms. On end walls and between windows, a relief mold is pressed into the concrete while it is plastic to create an interesting design at these points.

When the concrete has hardened sufficiently, the walls are covered with waterproof paper and kept moist for at least two days. They may then be lifted from the forms with a crane and vacuum pad, and are leaned against "A" frames mounted on truck trailers for transportation to the building site.

A Recent Development

The sandwich-type construction, where concrete layers enclose insulation material, is a fairly recent development. Although this is the first residential job to use concrete sandwich walls, this type of wall is being used in a Kraft Foods Co. warehouse now being built near Atlanta, Ga., by the Corbetta Construction Co.

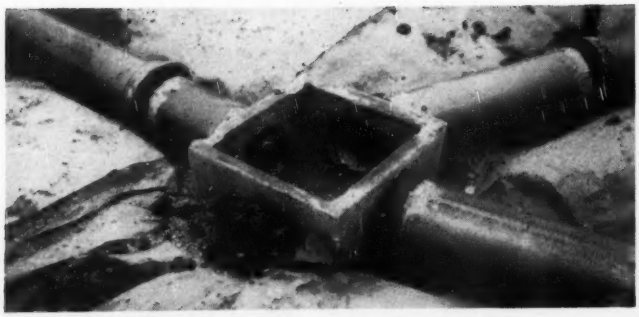
Also, a paper mill has been built in Canada using sandwich precast slabs 6x10 ft in area as curtain walls. These walls are only 5½ in. thick, as compared to the 8-in. load-bearing walls used at Great Lakes. The Great Lakes walls also are larger, some being up to 28 ft long and 8 ft 10 in. high

Foundation walls and footings for all buildings are cast integrally, with the inner face vertical and the outer face sloping. These walls are 3 ft deep, 8 in. wide at the top, and slope to a width of 16 in. at the base. The inside perimeter of the foundation wall is cast against rigid, waterproofed Fiberglas boards 1½ in. thick, 24 in. wide and 60 in. long—to provide insulation for a depth of 24 in. at the perimeter of the concrete floor slab cast on the ground. These insulation boards remain in place.

Before placing the concrete for the floor slab, 4 in. of washed gravel are spread over the excavated slab area and covered with vapor-proof reinforced building paper to provide a warm dry floor. Also, before any concrete is placed, pre-assembled plumbing is positioned and sewer pipe heating ducts are set into suitable patterns in the excavation. Sheets of 6x6-in. No. 10 gage mesh reinforcement are placed over the area, including the heating ducts. Screeds are then set and the floor is poured. The floor slab is 4 in. thick, except at the edges where it measures about 8 in.

The Flexicore precast concrete slabs used for second floors and roofs are 8 in. deep and 16 in. wide. In the case of the floor construction, the slabs span 24 ft and in the case of roof construction, because of over-hangs, the slabs are 28 ft long.

After joints between slabs are grouted, the roof slab is covered with 1½-in. Fiberglas insulation and the conventional membrane roofing with gravel top is applied. By installing the roof in this man-



HEATING DUCTS for ground floor, made of sewer pipe and cast into floor slab, connect into precast concrete plenum chamber. Originally, inflated rubber tube forms for heating ducts were installed, then collapsed and pulled out after slab had set. Sewer pipe ducts proved more economical.

ner, and by using concrete sandwich walls, an over-all heat transmission coefficient (U factor) of 0.20 is obtained, which is substantially better than FHA requirements for the area.

In the case of two-story buildings, the second-story Flexicore floor slab is made smooth for asphalt tile finishes by use of a ¼-in. underlayment made of emulsified asphalt, sand and cement.

The precast, hollow-core concrete floor system (Flexicore) is put to unique use in these units. Forced warm air used in the heating system is conveyed through the Flexicore holes directly to the floor registers on the second floors of all two-story buildings.

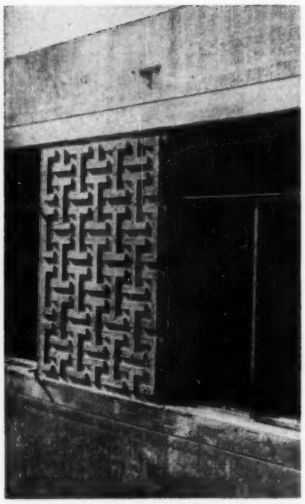
Principal advantages of the type of construction used on this job are:

1. Economy. These 1,000 units are being built for about $9 per sq ft of floor area in a locality where costs of $12 to $17 per sq ft prevail.

2. Simplicity. Buildings are assembled by erecting and connecting large units. Finish work on ceilings and exterior walls is reduced to the application of paint.

3. Speed. As many as 43 wall panels have been lifted from the casting beds and erected in one day.

4. Appearance. By properly scheduling casting-yard operations, ten different architectural effects are being achieved to prevent the monotony of repetition so common in large housing projects.

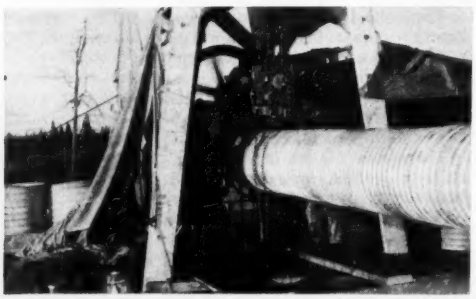


DESIGNS ARE PRESSED into plastic concrete with a relief mold to bring variety to walls. Architectural effects and colors eliminate housing monotony.

5. Durability. All structural members are reinforced concrete.

W. E. Hendrickson is project engineer for Corbetta-Price. Mario Egedi is construction superintendent. Harry Cadenhead is project superintendent for Shaw, Metz and Dolio, Chicago architects who designed the dwellings. Concrete is supplied by Lake County Ready Mix Co., Chicago.

They Make Pipe in the Wilderness



CORRUGATED PIPE fabricating plant in action at Burnt Creek, Labrador, 320 mi north of the Gulf of St. Lawrence. Construction of 360 mi of railroad to bring iron ore from the Knob Lake beds requires thousands of feet of drainage culverts. Packs of Armco corrugated sheets and pipe-making equipment were flown to the site by a cargo airplane lent by the Air Force. A gasoline engine powered the forming rolls that converted the flat sheets into short pipe sections (left). Punch-riveter (at right), belt-driven by an International Farmall tractor, joins the sections into the length culvert required. Pipe diameter ranges from 24 to 60 in. Project also will consume thousands of linear feet of Armco's Multi-Plate pipe (field bolted), in diameter from 5 to 12 ft.

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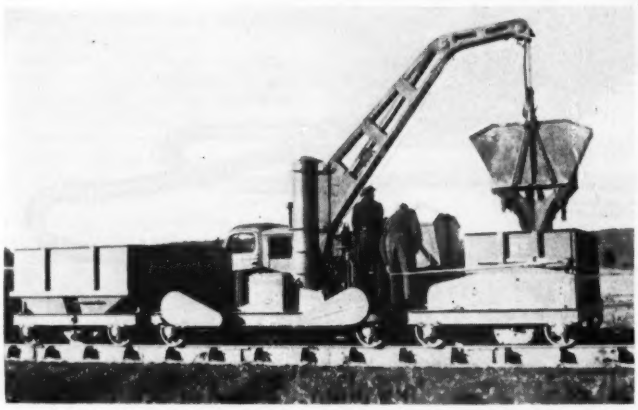
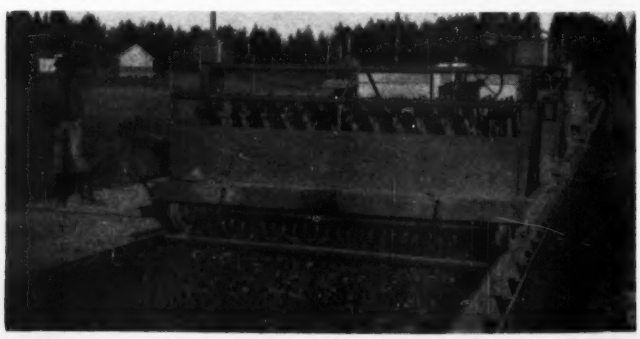
With this equipment parade, which is moving up the road to the left . . .

Norwegians Mix Highway Concrete Right on the Subgrade



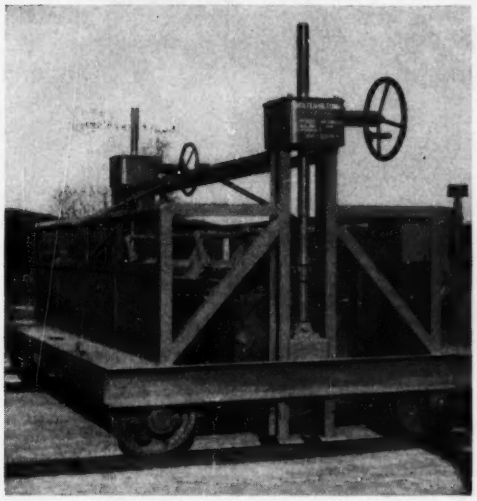
CRANE AND SPREADERS for mortar and coarse aggregate lead equipment train, all riding on road forms. Here, tub of mortar delivered by truck is dumped into spreader hopper.



SHEEPSFOOT ROLLERS follow spreaders, kneading aggregate into mortar layer to produce concrete. Process breaks down colloidal film around cement grains, improving hydration.

IN NORWAY, concrete highways are built by dumping a sand-cement mortar on the prepared subgrade, then kneadnig the coarse aggregate into it. The unusual method—called the Holter system—requires special construction equipment and makes no provision for slab reinforcement. However, proponents of the scheme (and, since the war, 90% of all Norwegian concrete roads have been built by this method) claim it produces better concrete at less cost.

The better concrete results because a substantial part of the coarse aggregate, which possesses the greatest wearing strength, remains on top of the pavement to give a more homogeneous and enduring surface. The reduced cost—a saving of approximately 20%



SMOOTH ROLLER compresses concrete behind sheepsfoot. This machine and tamper (right photo) are shown on exhibition at fair.

MECHANICAL TAMPER brings up the rear. In use, this transverse unit is coupled to two others carrying diagonal tamping shoes.

—results from 15% less cement consumption, and use of a smaller mixer because it does not have to handle any of the coarse aggregate. In addition, traffic can travel on the pavement within a day or two of completion.

Equipment Rides Forms

The Holter pavement is laid within standard steel road forms on which the paving machines ride. This train of equipment includes, from front to rear: (1) a mortar spreader, (2) a loading crane, (3) a stone spreader, (4) two sheepsfoot rollers, (5) a smooth roller, and (6) three tampers. All except the mortar and stone spreaders (which are coupled directly to either end of the crane) are self-propelled.

Mortar and stone are delivered to the job in trucks carrying special bottom-emptying tubs. The tubs are lifted by the crane, and their material emptied into hoppers on the respective spreaders. As the machines advance along the forms, a layer of mortar is distributed evenly on the subgrade by an oscillating screed, and the desired thickness of stone or gravel is put down on the mortar.

Sheepfoots Make Concrete

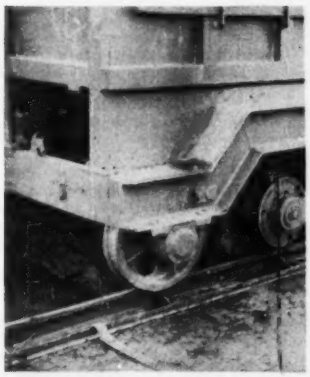
When the materials have been deposited, they are subjected to the kneading action of two connecting sheepsfoot rollers moving to and fro along the road. The rollers press the coarse aggregate into the mortar, which in turn works upward. After approximately 20 min of rolling, a thoroughly mixed concrete with exceptionally low water content is obtained.

Next, the concrete slab is compressed with a heavy smooth roller that expels possible entrapped air. The position of the rollers can be adjusted to the required height to produce an even and controlled surface. At this stage of the work, the slab joints are set.

Tampers Finish Slab

Slab construction is completed with three tampers—two working diagonally and one transversely. The number of blows can be adjusted from 120 to 250 per min, and height of the tamping shoes also can be regulated to give the desired impact. Surface finish is applied by a smoothing template that works sidewards along with the last tamper.

Average paving progress with a 22-man crew is 1,800-1,900 sq yd of 5¼-in. slab per 8-hr day. When the machines have completed their work, the concrete road slab is so hard that it can be walked on almost without leaving any imprint at all. Also, the mass shows no tendency to flow, an important point when paving super-elevated curves. Test cores drilled from 11 different Norwegian roads averaged 7,150 psi after six months—and this from mixes with only 460 lb of cement per cu yd.



STIFF MORTAR, shown being deposited on subgrade by spreader, makes strong concrete when coarse aggregate is worked in. Strength of 5-sack mix averages better than 7,000 psi.

The Holter system was developed in Norway in 1933-5. While the total amount of concrete pavement in that country is comparatively small, this method of mixing in place has been used on 73% of the concrete roads. In addition, it has been tried successfully on airports. The first such runway slab was only 3½ in. thick, but is still in good condition after 14 years' service under medium passenger planes.

No other crane gives you Tournacrane's revolutionary operating advantages for erecting and "roustabout" crane service. You get a completely mobile unit capable of lifting, carrying and placing heavy loads in *any footing* . . . the versatility of many interchangeable tools, yet the operating and maintenance economy of only *one*. Check these 7 exclusive features, then see performance reports below for proof of Tournacrane's ability to make and save money for you too!

1 **Powered mobility** . . . prime mover's powerful diesel engine, torque-proportioning differential plus flotation of 4 big, low-pressure tires, powers full loads over all kinds of footings, pavement, blacktop, soft fill, etc.

2 **Makes 90° turns** left or right, with power steer plus independent drive to give you accurate simplified load placing in restricted areas with minimum maneuvering.

3 **3-way crane action** . . . boom can be raised or lowered, extended or retracted . . . hoist block raised or lowered by powerful electric motors operating singly or together for fast, safe spotting, power action up and down avoids jerking . . . gives safe load handling.

4 **Stability without outriggers** . . . safely counterweighted by entire prime mover, handles capacity load over 360° swing, at all heights and all boom extensions. On haul, Tournacrane's short boom and short line eliminate dangerous swing of loads normal with such work.

5 **Travels, lifts under low overheads** . . . rig is only 9' 2" high with boom lowered. Can work inside buildings . . . reaches up 35' through structures, low doors, under bridges. Additional interchangeable booms available for special applications.

6 **Finger-tip control** . . . no levers to "fight". Dashboard electric switches control lifting and steering to make operation easy and simple. Competent operators can be trained with a few hours of instruction.

7 **Few parts, low maintenance** . . . no complicated operating and driving mechanism. Tournacrane operations are controlled by small, compact interchangeable electric motors. Rugged box beam construction of carriage and boom stands up under extreme loads.

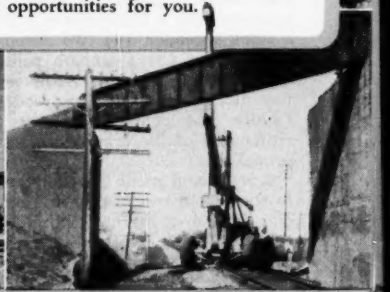
Be sure to contact your LeTourneau Distributor . . . he'll be glad to give you all the facts on Tournacrane plus facts on prime mover's interchangeability with other LeTourneau earthmoving and hauling tools that can mean greater profit opportunities for you.

Safely hauls concrete pipe

Queen City Concrete Pipe Corp., Cincinnati, builders of concrete sewer pipe, used Tournacrane to lift and move giant 12.8-ton, 120" I. D. sections to sewage disposal job 1.1 mi. away at Evansville, Ind. Equipped with short jib-boom crane, unit moved through residential area over surfaced and paved roads at speeds of 10 to 15 m.p.h. Job-to-job, rig travels to 35 m.p.h.

Places giant panels

Bee-Cee Builders, Skokie, Ill., chose Tournacrane because of its unusual adaptability to their building method, "Tilt-Up Construction." Highly-mobile rig did entire job of lifting, hauling, spotting and placing giant 19'6" x 16'2", 6" thick, 19,000 lb. panels. "I started saving money and time when I got Tournacrane on the job", commented Leonard Berisof, Bee-Cee partner.



Lifts overpass structures

Texas Delivery Service, Dallas, use Tournacrane for a variety of jobs. Here, it sets steel for bridge *without outriggers*—lifts totaled 50,000 lbs. Rig travels anywhere . . . over any surface, drives through traffic, under low wires, across curbs, onto rail right-of-way, follows or crosses tracks with no damage to roadbed or tires. Rolls easily through mud, sand or snow.

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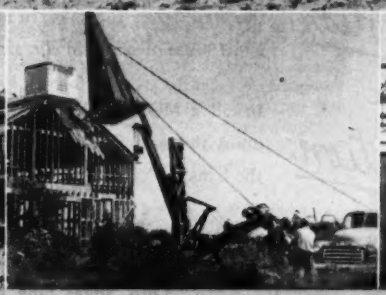
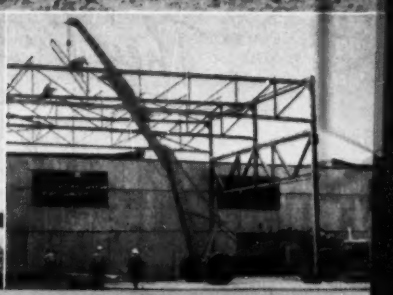


Speeds building projects

Versatile Tournacrane raises church steeple at army post in Illinois. Operator easily maneuvers machine into most favorable position, controls movement of elevator track, boom and hoist block by simple electric dashboard switches. Tournatorque motors, which power the lift, start and reverse smoothly to give precision placing with complete safety.



Erects factory framework

Tournacrane proved itself capable of accurately handling difficult assignment raising "I" beam support columns, cross members and jack trusses ranging in length from 10' to 40' and weighing from 100 lbs. to 4,000 lbs. With 10' boom extension added, rig easily set pearling in difficult places on top of jack trusses. Powerful, disc-type air brakes hold position securely while placing.

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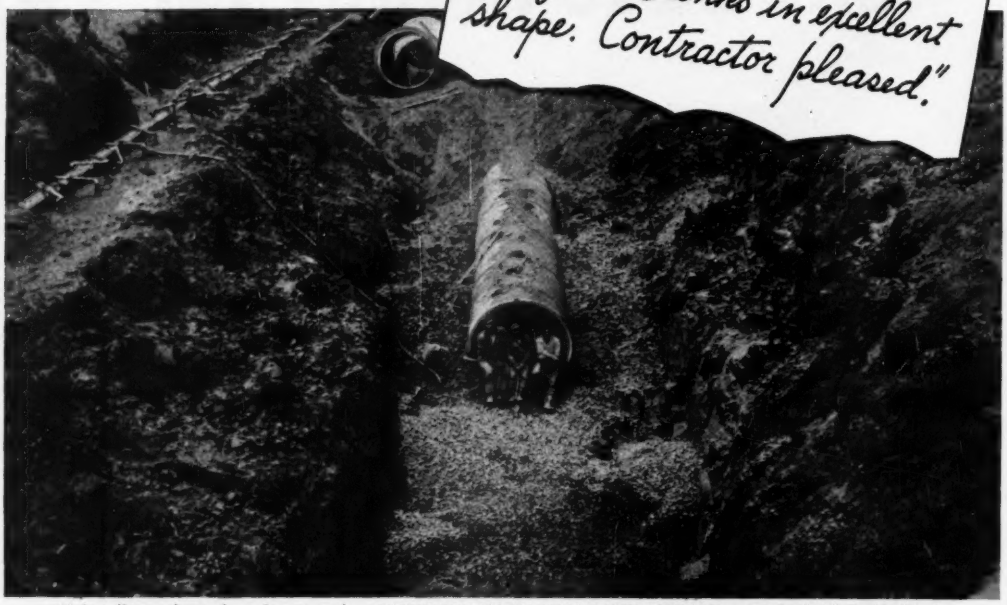

He's talking about the job pictured — OVERPECK VALLEY SEWER REPLACEMENT at Ridgefield Park, N. J. UNION BUILDING & CONSTRUCTION CORP., PASSAIC, Contractors.

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CONSTRUCTION LABOR NOTES . . . By JIM CONNOLLY

Supreme Court rules on some perplexing issues concerning . . .

Secondary Boycotts in Construction

SINCE 1947 when the Labor Management Relations Act (Taft-Hartley) was passed, courts in the National Labor Relations Board have sought to reconcile the secondary boycott section with the other provisions of the act. The main problem involves the interpretation of the "Freedom of Speech" and the "Right to Strike" sections where they conflict with the "Secondary Boycott" section.

However, the United States Supreme Court has now settled several of the perplexing issues. On June 4, 1951, it passed on four cases: NLRB *vs* International Rice Milling Co.; NLRB *vs* Denver Building Trades Council; Electrical Workers *vs* NLRB; and Carpenters & Joiners *vs* NLRB.

The four decisions by the high court resulted in a sweeping approval of many of NLRB's past interpretations concerning Sections 8 (b) 4 (a) of the Act, and broad rulings were laid down by the court, most of which concerned the construction industry.

• The decisions are as follows:

1. The LMRA applies to a construction project even though the value of the interstate goods used in the particular project is of a small but "not negligible" amount.

2. Union action which attempts to prevent a general contractor from doing business with a subcontractor is illegal and constitutes a secondary boycott, as contractor and subcontractor are deemed to be two separate and independent employers.

3. A union may have lawful objects in picketing a project, but if one of the objects is to cause a neutral employer to cease doing business with a primary employer —and it is clear that the picketing is directed to that end—this picketing is unlawful.

4. Secondary boycotts are not banned unless there is an inducement to "concerted conduct" on the part of neutral employees.

5. Section 8 (c), the free speech provision of the LMRA, protects non-coercive speech which has a lawful object, but does not protect peaceful picketing in furtherance of a secondary boycott.

• What is a Secondary Boycott?

Secondary boycott is a term that is difficult to define satisfactorily, but the general activity is well-known. For example, A is a general contractor whose ready-mixed concrete is supplied by B. Employees of A engage in a strike for higher wages against their employer and place a picket line around the job. B continues to do business with A, so the employees of A place a picket line around B's trucks, thereby inducing his employees to cease work.

This act of placing a picket line around B is known as a "secondary boycott" and is prohibited under the act. Conduct directed at A by A's employees is a "primary activity", and conduct directed by the same employees against B is known as a "secondary activity." Primary picketing, as noted above, would be protected under the board's interpretation of the LMRA.

• Free speech

Interpretation of Section 8 (c) in relation to secondary boycotts has been a difficult problem facing the board. This section provides, in substance, that the expression of any views or opinions "shall not constitute or be evidence of any unfair labor practice under any of the provisions of this act" if the expression of views contains no "threat of reprisal, or force, or promise of benefit."

If this action were to be interpreted literally, it would practically do away with the ban against secondary boycotts. This is true in most cases since secondary boycotts normally involve peaceful picketing by which the pickets, with their signs and placards, try to induce other employees to cease work also. The board has held, and the Supreme Court concurred, that the secondary boycott ban is not negated by the free-speech clause.

• Application to construction industry

An important question that the board and the court had to answer was this: Are a general contractor and his subcontractors separate employers when working on the same construction project, or are they "allied" or "one"? The answer determined whether a union's activity, aimed at breaking the business relations between a general contractor and any of his subcontractors, is in violation of Section 8 (b) 4 (a) and, therefore, a secondary boycott, or that it is not a violation and is permissible under the act.

If the contractors are "one", the doctrine of "primary activity" will protect the picketing union; if they

are separate and independent, attempts to break relations between them probably will be declared a secondary boycott.

In the case of the electrical workers, Judge Clark of the United States Court of Appeals dissented — stressing economic realities present in the construction industry. In substance, his argument was that ordinarily it may seem clear that a secondary boycott includes picketing an employer when he and the union are engaged in a dispute over his doing business with someone else. However, the building trades present a unique situation.

A workman in the construction industry may be employed by different contractors from week to week. Therefore, if the practice of hiring non-union men is tolerated, Judge Clark says that union men will stand less chance of being employed at union rates. It may be argued that every union construction worker has a genuine dispute, therefore, with all contractors on the site, since he is seeking to force them to act for his long-range benefit by not hiring non-union subcontractors.

It might be said also that when a union refuses to work alongside a non-union man, it is not necessarily striking against the secondary employer or subcontractor who hires such men, but is striking against all other contractors for allowing the non-union subcontractor on the job in the first place.

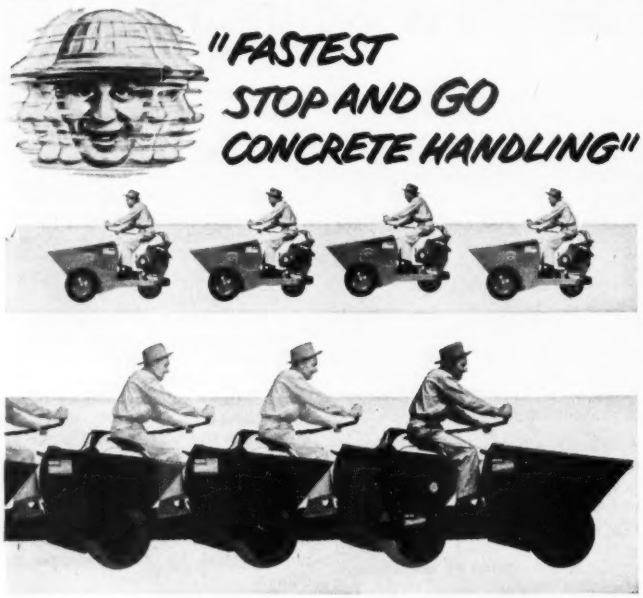
The dissenting judge further pointed out that one of the most forceful reasons for banning secondary boycotts is to prevent the dispute from spreading beyond the struck plant. But in the construction industry, the conflict is usually confined to the construction site—the only place where a union can object effectively to the hiring of non-union workers.

The court decided, however, in interpreting the section that if one object of a strike is to force an employer to cease doing business with another, a secondary boycott has been committed, and the court's conclusion was supported by Senator Taft. The court said further, "We hold also that a strike with such an object is unfair labor practice within the meaning of the section."

Although the court gave consideration to the fact that the two contractors were working on the same job at the same time, and the general contractor had some supervision over the subcontractor's work, these factors "did not eliminate the status of each as an independent contractor or make the employees of one the employees of the other."

"Duration of Contract" Means Just That

Back in 1946 Jones-Wright Co. and a Kentucky AFL Local of Operating Engineers agreed on wages that "would continue in effect for duration of this contract" which was estimated to take "1,000 days or until 1949." Upon completion of this and other similar agreements the U. S. government awarded the $18,000,000 Wolf Creek Dam contract to the company. The job strung out beyond the expected completion date and in July 1949 the union struck for a wage increase. The Kentucky Appellate Court recently ruled, however, that the contract was binding until completion of the job, even though longer than anticipated.



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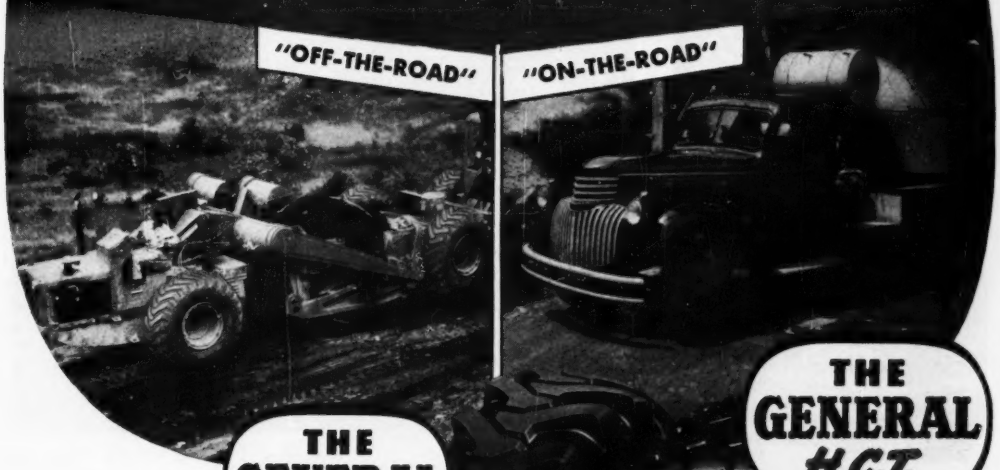

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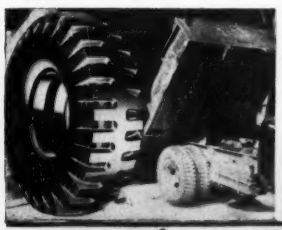
GENERAL D. T. L. with deep, sharp, angled cleats and sturdy, high shoulder lugs. Designed for maximum traction on soft surfaces—forward or backward.

GENERAL H. C. T. for trucks that go off-the-road to pick-up, deliver loads. Free-rolling tread and stronger body for more miles, more safety.



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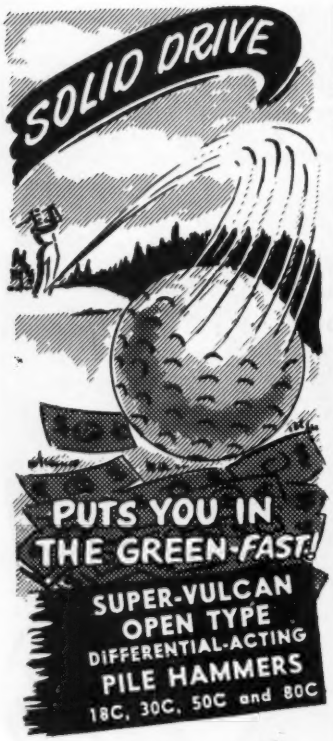

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Super-Vulcan's rapid hard-hitting power enables you to drive pile after pile in less time. It cuts hours off work schedules, saves users on time costs. It's economical to own, too, for the open-type fits the same leads and uses the same accessories as Single-Acting Vulcan.

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Here Are the New Pumps You Contractors Asked For

By HAROLD W. RICHARDSON, Editor

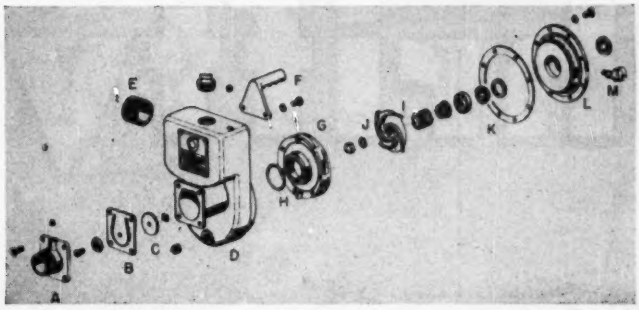
TRIM COMPACTNESS features outward appearance of Marlow's new line of contractor pumps. They are equally trim and compact on the inside. Note intake at impeller level and discharge at side of tank.

JUST THREE YEARS AGO this month Marlow Pumps, Ridgewood, N. J., decided to design and produce a completely new line of contractor pumps. They had been turning out pumps for construction ever since 1924, and some mighty good models, too. But they felt that certain features they had developed in their petroleum and industrial lines might be applied to contractors pumps to good advantage, even if it did mean a complete new design unit.

So the engineers went to work. After several months they came up with something pretty good, and the sales force was called in for a look. "Uh, uh! No good," said these heartless souls. They had been out in the field, talking to contractors and distributors to learn just what the construction world wanted and expected in a new line of pumps.

Somehow, they felt, the new designs didn't quite measure up to the contractors' stated requirements: (1) Simplicity of construction with a minimum number of parts for better operation and easier maintenance; (2) fast, high and dependable priming even when the pump is operating under a high suction lift; (3) ability to handle trash without clogging or losing prime; and (4) above all,

HERE'S HOW the new pump looks from the other side. The various sizes come in just about any style mounting you want, from skids to full wheels.



MINIMUM OF PARTS is one outstanding characteristic of the new line, as indicated by this exploded view (engine not shown). Starting at the intake end, the parts are: **(A)** threaded intake coupling, attached to tank by 4 bolts; **(B)** intake flange gasket, integral with check valve flap; **(C)** check valve that bolts to gasket flap; **(D)** one-piece main tank, with drain-plug at bottom, intake in line with impeller, discharge **(E)** at upper far side, and big filler plug in top; **(F)** lift handle (large models have lifting eyes); **(G)** five-outlet diffuser that fits around impeller, key to self-priming without valves, holes or tubes; **(H)** diffuser O-ring seal against suction chamber; **(I)** impeller, fastened to engine shaft by cap nut; **(J, K)** seal assembly unit; **(L)** lantern; **(M)** grease cup and ring, vented to relieve excessive pressure.

high efficiency and maximum dependability — steady performance with little attention and large output with minimum fuel consumption.

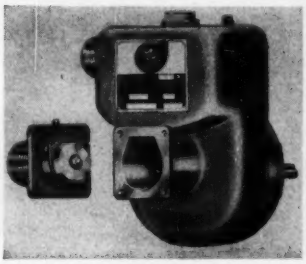
So Marlow management tore up the blueprints and the engineers started afresh. This time they clicked and, by November 1950, they produced a series of new designs that met with hearty approval of both sales and administrative departments. Pilot models were turned out in a hurry.

Then followed laboratory and field tests that resulted in further improvements. Also, several changes were made in the interests of economical manufacturing, without impairing the pump characteristics in the least so that the product could be sold at a price that will stimulate, rather than restrict, sales.

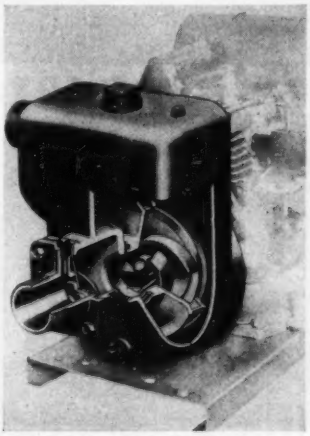
The plant started tooling up for the new line last August, and by late November pumps were beginning to roll off the assembly line. Thus, Marlow expects to have a good stock of new units in the hands of distributors by the time the models are first introduced to the trade at the A.E.D. convention late in January.

We visited the Marlow plant recently and watched the new pumps being built. We also studied cutaway models, examined the various parts making up the completed assembly, and watched the units being put through tests in a fully equipped hydraulic, dynamic and electronic-controlled laboratory.

(Continued on page 78)



INTAKE COUPLING (left) bolts on to tank in line with impeller, gasket tongue holds check-valve set at angle for easy, tight closing. Side discharge coupling is at upper left of one-piece main tank.



SIMPLE INSIDE ASSEMBLY is revealed by this cutaway view. Note direct intake flow into center of impeller. Diffuser surrounds impeller.

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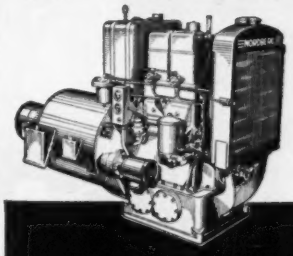
DIESEL POWER
AT ITS BEST!



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The 4FS series incorporates the same high standards of design, construction and performance that have been identified with world-famous Nordberg Diesels for over 35 years. For electric power, for pumping, for energizing lifting magnets, and for scores of straight power applications . . . you just can't beat the reliability, low operating cost and minimum maintenance offered through the use of Nordberg 4FS Diesels.

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4FS152

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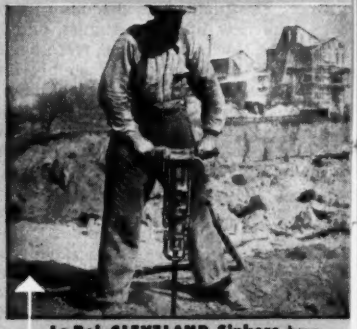
Le Roi Airmasters have 10% to 30% lower piston speed—for less wear, longer life, lower fuel consumption. Heavy-duty Airmaster engine is designed especially for compressor service — it is not just an automotive unit slowed down. Airmasters stay on the job longer, produce more air for less. Sizes, 60 to 600 cfm.



Le Roi-CLEVELAND Sinkers have strong rotation, powerful blow from snappy valve action. Drill more inches per minute. Easy to hold, kickback is reduced. Operators get less tired, drill more feet per shift. Sizes, 17 to 82 lbs., including the popular H10 and H111.

Team cuts costs with plenty of air, plenty of wallop

Le Roi Airmaster Compressor and Le Roi-CLEVELAND Rock Drills and Paving Breakers

HERE'S a team you can't beat—and here's why:

First of all, you've got a Le Roi Airmaster Compressor. Airmaster dependability means air in a hurry — as much as you want — when you want it! Airmaster construction features mean longer engine life, less maintenance, lower operating costs.

Then, you've got Le Roi-CLEVELAND air tools. Their exclusive valve action assures low air consumption — high air pressure at the tools. They really stand up, too — break more pavement, dig more clay, drill more rock, tamp more fill.

Yes, sir, the Le Roi Airmaster, Le Roi-CLEVELAND tool team pays off with top satisfaction at bottom costs. Job data from all over prove that.

Have your nearest Le Roi distributor put this team through their paces for you. Visit him now. Write for bulletins.

LE ROI COMPANY

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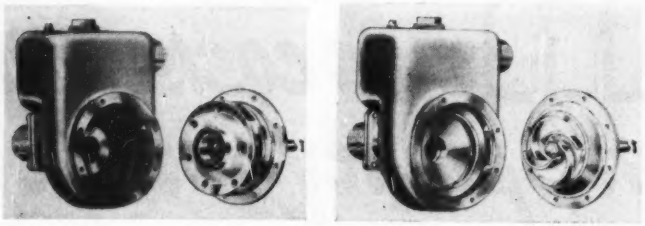
Le Roi-CLEVELAND Breakers and Spades pack plenty of punch for speedy work in the hardest concrete or stiffest clay. Protective air-cushion in front end assures long life. Well balanced for easy handling. That's why operators like them — do more work with them. Sizes, 15 to 80 lbs.

Tractair is a combination tractor-105 cfm compressor that can be equipped with a wide variety of attachments. Does the work of specialized equipment — breaking, drilling, digging, tamping, loading, lifting, backfilling, snow-plowing, etc. Saves you money on initial investment and on job costs.

C-133

MARLOW PUMPS . . . Continued from page 75



CLEAN INTERIOR of tank (left) is enhanced by bosses for ring stud bolts that keep bolt ends out of the water. Impeller here is shown inside diffuser. But when you remove ring bolts in the field, diffuser comes off with tank, as shown in right view, exposing impeller fastened to engine shaft by cap nut. This means easy cleaning and ready access to all parts.

They're beauties. Of course, you don't buy pumps according to looks, but you can't help but be impressed by the simplicity and compactness of their appearance. You notice right off that the intake is horizontal in line with the impeller and that the discharge is through the side instead of at top of tank or main case, and the tank is all one piece.

They are short-coupled with the engine, too, which cuts down on over-all size. Also, one ring of bolts holds the tank to the lantern, and when these are removed there is the impeller right in the open for easy access.

Let's take a look inside the pump, starting with the intake coupling. The intake connection is a short, threaded nipple held to tank with four stud bolts. The flange composition gasket carries the intake check valve, set on an angle for easy closing by gravity; yet it rises well out of the way of the incoming stream when the pump is operating.

Now as to self-priming features: Marlow has eliminated the usual holes, self-closing and otherwise, between the suction chamber and the impeller chambers through which water recirculates during priming. Instead, the engineers have gone all out for the diffuser system of priming. They have used diffusers on certain pumps in the past, so the idea is not new to them. The diffuser is a five-opening ring, fitting around the impeller, through which the discharge water passes.

Thus, in place of the usual one point of close clearance to create priming suction, there are five such points—and all are part of the diffuser, which can be replaced or repaired when worn or damaged. The diffuser also distributes the discharge pressure equally around the impeller, so there is no side pressure upon the impeller or its shaft.

A rubber O-ring seals the diffuser against the suction chamber. When the tank is removed by loosening the one ring of stud bolts, the diffuser slides off with the tank, leaving the impeller in the clear. Incidentally, both the intake flange bolts and the tank stud bolts fit into inside bosses so there are no exposed ends of bolts to freeze up with rust.

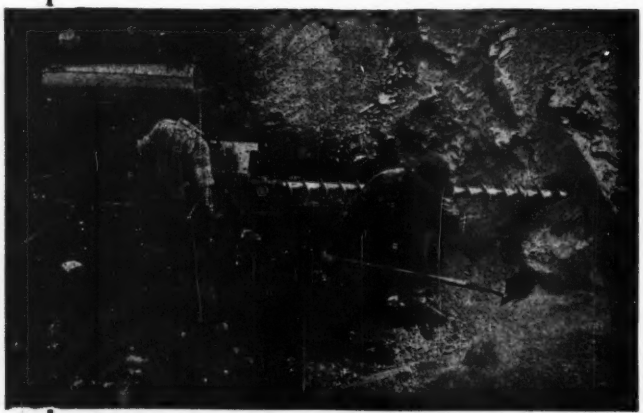
The impeller is keyed to the end

Parmanco

HI-SPEED HORIZONTAL

DRILLS

New Traction Drive with Forward and Reverse



THIS UNIT IS DELIVERING *6-inch shot-holes* READY FOR LOADING *at better than* TWO FEET A MINUTE!!

The new Parmanco Hi-Speed Horizontal Drill is completely redesigned around a 40 h. p. engine with four drilling speeds which, in field tests, has cut one-third off the footage drilling time — a cost-per-drilling-foot saving that we are passing on to the strip mine operator and contractor at no increase in our price. In addition, the drill is equipped with a starter and generator, dual type front wheels, truck type rear axle with mechanical brakes and a traction drive with both forward and reverse.

For both Mines and Construction

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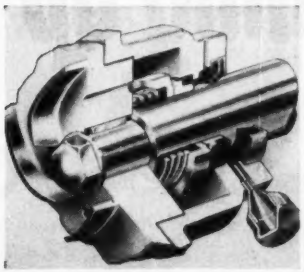
of the engine shaft and secured by a single cap nut. This prevents the impeller from loosening on the shaft when the engine happens to kick back and reverse the rotation.

The seal is exceedingly simple. A stainless steel spring holds the seal assembly in place, and a rotating rubber collar drives the rotating seal ring and holds it to the shaft. The few metallic rings are precision ground. A synthetic rubber seal collar supports the stationary elements and acts as a



SEAL ASSEMBLY has been reduced to minimum of parts, as shown in this cutaway drawing. Holes through impeller collar equalize and even reduce hydraulic pressure on seal.

shock absorber. Excessive pressure on the seal from the grease wall is prevented by a grease vent. Two holes through the impeller collar keep pressure from building up within the seal assembly; in fact, they act as a suction to reduce the pressure most of the time.

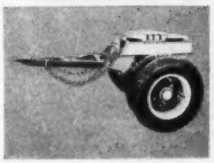
Marlow offers the new pumps in a full line of contractor's models, which will replace the old line. While they come in a wide range of sizes from 1½ in., rated at 4,000 gph, to 10 in., rated at 240,000 gph, the number of total models has been reduced from 41 to 28. Ten new models are available with air-cooled engine drive, from 1½ in. to 4 in., rated at 4,000 to 40,000 gph. Five units from 4 to 10 in. are being built for both diesel and water-cooled gas engine drive, rated at 40,000 to 240,000 gph. Eight models from 1½ to 4 in. are available in high-pressure ratings for air-cooled gas-engine drive.

Rated capacities? We saw engines meeting A.G.C. Pump Bureau ratings under low engine speeds in the laboratories, and rating curves of all models show this to be true in every case. Also, every new model is showing greater capacity than the corresponding unit in the old line.

Choose LaCROSSE heavy-duty TRAILERS

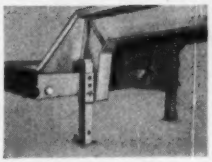
85 Models . . . 6 to 67-ton capacity . . . single, dual or tandem axle . . . flat, drop or tilting platform

WITH FULL LINE OF JOB-PROVED ACCESSORIES



REMOVABLE DOLLIES

8 sizes—6 to 25-ton capacity—with semi-automatic fifth wheel for converting semi-trailers to full trailers in one simple operation. Provides economical "stand-by" for lay-over operations.

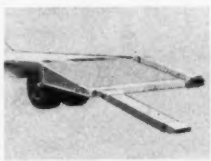


POST LANDING GEAR

Simplifies releasing loaded or unloaded trailers without danger of falling off of blocking. 66,000 lb. gross load capacity with 3 simple hand adjustments for equalizing uneven levels in roadbed.

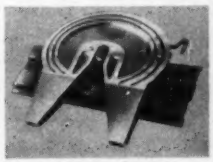
HAND BRAKE

Increases braking power . . . relieves tension on tractor brakes while holding loads on inclines, or for level parking. Ideal for locking trailer while hooking tractor. Located on left side of gooseneck.



BEAVER TAIL

Increases platform area . . . lowers rear loading point, thus making load easier, safer without use of conventional skids. Short pair of hinged skids (shown) available at slight additional cost.



FIFTH WHEELS

Choice of Holland or Austin designs with capacities from 24,000 to 60,000 lbs. for handling gross king pin loads both on and off highway. Semi-automatic, full floating types with rubber mounting.

SKID RAILS

Furnished on side or rear channels for users who prefer skid rail method of loading. Also complete selection I.C.C. lights, air or vacuum brakes, extension brackets, lashrings, load binder, tire carrier, etc.

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in the big year coming up

MOVES MORE PAYDIRT PER DAY! That's International's Big Red TD-24—the most powerful crawler on the market—the crawler that gives you the fastest work cycle.

Here's help... where and when you need it... with your International Industrial Distributor's ready service and parts departments

Your crawler tractors have to pay off with more work done per day, more days worked per year.

That means speed and power. The ability to stay on the job. Minimum downtime.

And it also means fast maintenance service at your call, when and where you need it.

That's your International Industrial Distributor's service—service that includes

TRAINED "DIESEL DOCTORS"—factory-trained specialists in maintenance and overhaul.

PROMPT FIELD SERVICE at your job site to help keep your equipment working, to get it back to work faster, to cut costly downtime on the spot.

COMPLETE SHOP FACILITIES for major work—you're never far from an International Distributor's shop, no matter where your equipment goes.

QUICK PARTS SUPPLY from your distributor's fully stocked parts department, backed by International Harvester's network of strategically located parts depots (in size and scope, exclusive in the industry).

Isn't this *complete* service a mighty good reason to get International *"Power that Pays"* for the hard-working years ahead?

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POWER THAT PAYS

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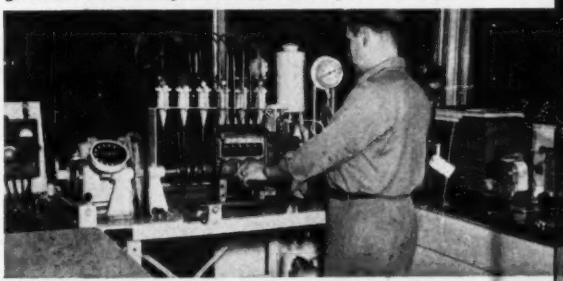
YOU NAME IT—your International Industrial Distributor has it in his big, efficient parts department. And if he hasn't, he can get it fast from his nearby International Parts Depot.



"HEART SPECIALIST!" A crawler's heart is its sturdy fuel pump. It seldom needs attention. When it does, this "diesel doctor" operates with precision instruments in a special dust-free room.

HERE'S HELP WHEN YOU NEED IT. Skilled, experienced mechanics equipped with the right tools for doing major maintenance fast at your International Distributor's shop.

ON THE JOB! Here are an International Distributor's field servicemen, on the job at the job site installing an overhauled transmission. A phone call gets this kind of service.

For Greater Strength and Shock Resistance

"Look Under the Hood" of a BULL DOG V-BELT!

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Industrial V-Belts in A, B, C, D and E sections —full range of lengths from 26"-660"

1. The covers of BULL DOG V-BELTS . . . as durable as they are with their plies of closely woven, bias cut fabric represent only part of the BULL DOG story behind the long life and outstanding performance of these belts. That's why we say "Look under the hood!"

2. Immediately beneath the cover is the BWH-developed compression section of fabric and quality-controlled compounds. This is the basic reason why Bull Dog V-Belts *both* run cooler and DO NOT CRACK OR DETERIORATE UNDER SEVERE FLEXING.

3. Third basic factor in Bull Dog V-Belt quality is the specially engineered BWH Cord Section — exceptional in tensile strength — and the answer to the belt's heavy load carrying capacity and ability to absorb shock loads. Thank a new technique in processing these cords for MINIMUM STRETCH and the advantages of fewer adjustments, less slippage, longer belt life.

Put V-Belt problems behind you — ask your BWH distributor for a set of Bull Dogs. Do it as soon as you can!

TOUGH PROBLEMS INVITED — Don't hesitate to ask us or your nearest BWH distributor about your power transmission belting, conveyor belting and hose problems. We're specialists in making mechanical rubber products work *better, longer.*

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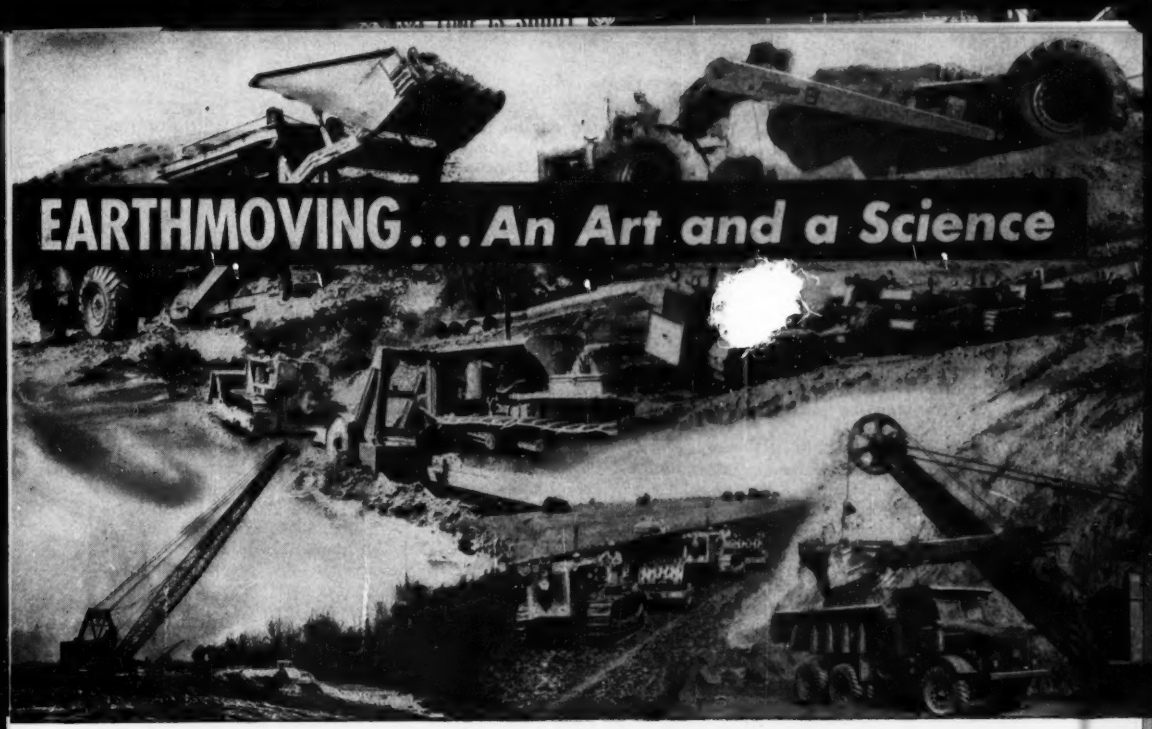
BWH
Fractional horsepower (FHP) V-Belts

COMPRESSION SECTION, engineered to withstand continual flexing.

BULL DOG CORDS, comprise a powerful, load-carrying section.



13. For Profitable Crane and Shovel Ownership:

Buy Machine with Equipment That Best Fits Your Needs; Insure Long Trouble-Free Service by Proper Break-In

By E. O. MARTINSON, Vice-President, Engineering, Koehring Co.

• **Ordering the machine**—After a study of the factors determining the size of excavator to be used, there are a number of items to be considered and specified on the order for a machine. Construction machinery is nearly always ordered through local distributors, who are able to aid in selection of the proper size and type. They have repair and service departments and stock many of the parts required in the servicing of machines. Many of them have their own demonstrators who can instruct the operators in the initial starting and operation of the machine.

Basic information required on the order is the size of the machine or model number for a particular manufacturer, the type of attachment, type of mounting and type of power unit. It is best to order the various attachments desired at the time the machine is shipped, because the cost is usually less. Attachments ordered separately at a later date require more handling at the factory, more crating and added shipping expense.

As to power, diesel engines are becoming more popular every year and the majority of excavators in the larger sizes of the ⅜- to 2½-yd range are diesel-powered and probably half of the excavators in the smaller sizes have diesel engines. Gasoline engines in the smaller sizes cost less and will run better at low idle speeds than the diesels.

The gasoline engine requires about 50% more fuel per hr than the diesel and, although the price of diesel fuel seems to be rising in relation to the price of gasoline, it is still considerably lower in price per gal. Fuel cost for excavators with gasoline engines will be about 2 to 2½ times as much as for diesel-powered models. This saving may run from .$20 per hr on the small excavator to about $1 per hr on the 2½-yd size.

A manufacturer may offer more than one make of engine. The purchaser then has an opportunity of selecting an engine of the same make used on other items of equipment he may already own, to aid in simplifying servicing and reducing his parts inventory.

Fluid drives or torque converters are available for engine drives and may even be desirable on electric motor drives. Electric power can be supplied for underground or other operations where exhaust fumes are objectionable. The usual voltage is 440 for the range of machines covered in this article. The electric cables and power supply should be capable of handling 2 or 3 times the full load current of the motor with less than 10% to 15% voltage drop.

• **Ordering optional machine fea-**

This article, the 13th consecutive one in a series on the fundamental principles of earthmoving, is sponsored by the Power Crane and Shovel Association.

tures—Longer and wider crawler spacings are available for lift crane and dragline work where greater stability is required than with a shovel. Two or more widths of crawler shoes are available to obtain greater flotation on soft ground. Increased counterweight can be used for dragline and lift crane purposes and there is generally a selection of two or more counterweight combinations, depending upon the use planned for the machine.

High A-frames may be desirable on draglines or cranes with long booms to reduce stresses in the boom, especially on the larger machines. These high A-frames may be available in the fixed or the self-raising or folding type. The folding A-frame, where the high A-frame is required, would permit the machine to be moved underneath obstructions with a minimum amount of delay.

Traction Drive Options

Independent traction drive may be available for certain models of machines which permit travel of the machine at the same time that swing occurs—by a separate set of clutches for traction in place of the standard arrangement where traction and swing are powered from the same set of clutches. Some models may offer two-speed traction, for either independent or standard traction arrangements, but most crawler cranes travel comparatively short distances and two-speed traction is not essential.

Power-lowering clutches for boom-hoist lines are available on most machines to permit lowering of the boom at a controlled rate of speed and, if automatic in engagement, provide an additional safety factor against accidentally dropping the boom too fast. A third auxiliary hoist drum may be available for piledriver work. Many other special features are incorporated to meet specialized needs for lift crane work, log loading and the like.

Separate engine-driven electric generating plants can be mounted on the excavator for 120-v lighting or 230-v dc lifting magnets. These 120-v or 230-v generators also may be driven from the main engine of the excavator at some saving in fuel cost and maintenance. Automatic voltage regulators can be furnished to maintain a fairly constant voltage over a considerable speed range of the main engine.

Sealed-beam low-voltage lights powered from the engine battery circuit at low cost may be adequate for many operations, if properly spotted on the machine. Other accessories that may be desirable on an excavator are horn signals, electric windshield wipers for the front window, hour meter for the engine, tachometer for torque converter output shaft speed, remote flasher alarm for engine oil and water, fuel tank-filling hand pump, centralized lubrication system, engine coolant and battery heater for keeping engine warm during shut-off in cold climates and diesel engine starting aid, such as the ether fluid bulk or capsule injector or inlet air heater. Even cigarette lighters and toilets have been suggested!

• **Optional attachment features**—Shovel attachments with longer-than-average sticks and booms are available on certain size machines for jobs requiring a high lift on the discharge, such as coal stripping work. Sometimes more than one size of shovel dipper is available, depending upon the type of work encountered. For hoe attachments, different widths of dippers and side-cutter arrangements can be provided to obtain a variety of trench widths. But the hoe dipper, as ordered, is usually the largest one the machine can handle safely and should be the size of the shovel dipper rating or slightly larger.

Dragline, clamshell and lift crane attachments can be ordered with several optional boom lengths, attained by standard length inserts. The boom can be obtained with sectionalized pendant suspension, as an option to full cable reeving to the boom point. This permits quick changes of boom length by removing an equivalent pendant insert. Otherwise, if a considerable change in boom length was to be made, it would be necessary to change the boom suspension cable, because there is not sufficient room to wind up the excess cable on the boom hoist drum.

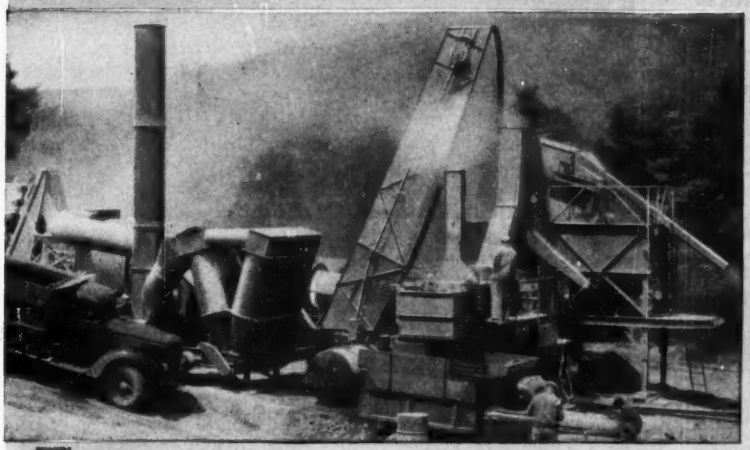
Boom stops to prevent the boom from falling over backwards can be ordered. A boom hoist clutch throw-out linkage which disen-

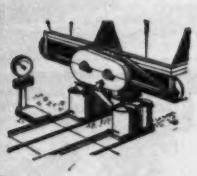
(Continued on page 86)

CRANE BOOMS can also have jibs to give more length or to reach over obstructions. Boom lengths are optional, attained by inserts as shown on this Link-Belt Speeder.

Barber-Greene

BITUMINOUS MIXING PLANTS





Mix sampling and calibration facilities provided on B-G High Capacity Plants for mixing highest type 3-and-4 aggregate mixes. Convenient, accurate calibration by weight.

ACCURATE MIX CALIBRATION...BY WEIGHT ON A CONTINUOUS FLOW BASIS CONVENIENT FOR OPERATOR AND INSPECTOR!

Barber-Greene Bituminous Mixing Plants provide many control features not offered in any other type of plant. Here are a few of the provisions that help accomplish these advantages:

AGGREGATE GATES, when set to feed the correct amount of aggregate from each bin, may be locked in position.

OVERFLOW SPOUTS are provided on each aggregate bin for balancing aggregate by rejecting any excess of any size in the bins.

AUTOMATIC CUT-OUT stops plant operation in case of deficiency of any aggregate size.

FINES FEEDER for introducing mineral filler in correct proportion to total mix.

GRADATION UNIT SCREEN and bin design permit separation of aggregate into 2, 3 or 4 fractions to meet *any* specifications.

DUST COLLECTOR for use with any plant when it is necessary to conserve desirable fines in aggregate.

BY-PASS GATE for convenient calibration, inspection and sampling. Aggregate in each bin may be individually sampled without interference to plant operation and production.

BY-PASS GATE ahead of pug mill. Composite aggregate sample may be obtained for convenient testing without interfering with operation and production.

ACCURATE, POSITIVE-DISPLACEMENT bitumen metering pump with interlocked drive to aggregate feeders to guarantee unvarying proportion of bitumen to aggregate.

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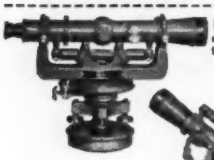
the exact instrument you need from these three

LOW PRICE MODELS

1

Model No. 8014
Price $145.00* complete with tripod

Finest 12" Dumpy Level available anywhere—gives you more features you want, more accuracy, more durability at less money than any other instrument. It has dust and dirt-free internal focusing and has coated optics for clearer distortion-free, sharper images.



Price $170.00* complete with tripod

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Model No. 7096

Here's the standard convertible level for the country for the past 30 years! No other instrument has the recognition and acceptance as given to the David White Carnegie Improved Convertible level. Now it's available to you with complete dust and dirt-free internal focusing and coated optics for clearer, sharper, distortion-free images.

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The David White "Universal" level-transit is the most practical and complete builder's instrument on the market. Now available in a *new improved model* — complete with internal focusing, coated optics — guarded vertical arc — in fact every possible feature to assure you lifetime durability and extreme accuracy.

CHOOSE the exact instrument you need from these three. Compare their outstanding features, their precise, yet rugged construction, their accuracy *and their price* with all others. Then you'll see why we say you'll buy "right" when you buy a David White. For complete information on any one or all three of these instruments, consult our nearest dealer — or write direct to David White Co., 343 West Court Street, Milwaukee 3, Wisconsin.

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We offer complete, prompt repair service on all makes of instruments — levels, transits, theodolites, etc.

EARTHMOVING . . . Continued from page 84

HOE DIPPERS are available in different widths and side cutter arrangements to obtain a Variety of trench widths. This Bucyrus-Erie is ripping up a paved street.

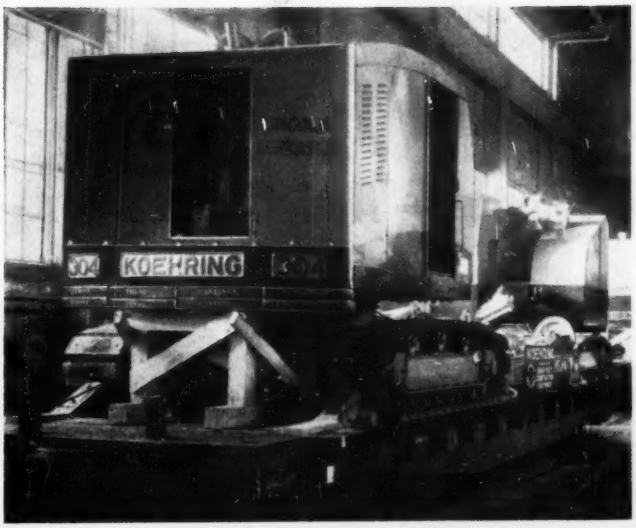
gages the boom hoist clutch at the maximum safe boom angle is a desirable feature on lift cranes.

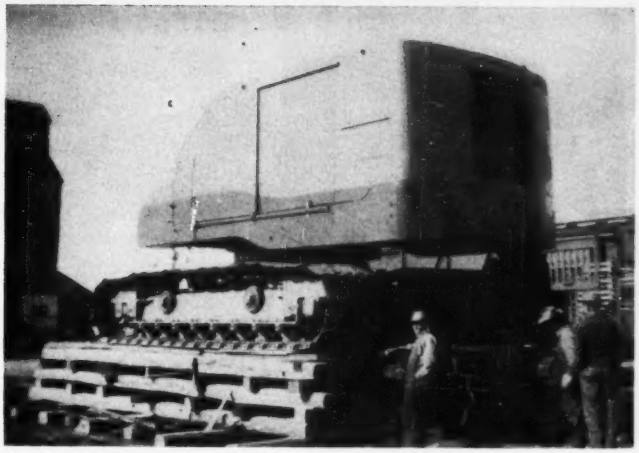
Jib extensions are available for crane booms. These can be extended in line with the boom or tilted down at some angle to allow reaching over a parapet or some other obstruction. Jibs are available in optional lengths also. The crane boom point sheave arrangement may be different for draglines or clamshells because only one boom point sheave is required for draglines, whereas two are required for clamshells.

Then again, for lift-crane work, it may be desirable to have three sheaves in the boom point to permit the use of 6-part lines or for piledriving where three hoist lines are needed. Tagline winders of the spring reel or slipping clutch type are available for booms for clamshell work. Magnet reels can be mounted on booms for lifting-magnet work. Lift crane work will require single- two- or three-sheave hook blocks.

• **Unloading**—It is relatively easy to unload small machines. They are narrow and can be run off the end of a railroad car on to a platform, cribbing or a bank of earth. The smallest machine can be turned on the car and run off sideways. With careful bracing, they may even be shipped with boom attached. Cribbing and unloading timbers usually are required to unload excavators from a flatcar. Low-bed highway trailers are the most economical transportation method for short distances, but the

QUARRY WORK can be hard on a shovel, even a big one such as this P&H 855B. Take it easy with all new machines until parts "wear in"; it will pay in the long run.





LOADING FOR SHIPMENT varies by size of machine, as these Koehrings illustrate. Large units move on flat cars with crawlers removed—sometimes are wide enough for handy unloading with trackside cribbing as above. Small machines fit with little disassembly.

loads may be limited to 1½-yd size in some states, or even ¾-yd in others, with the payment of special load fees.

Unloading of the larger cranes of this series may require the aid of a small crane or a gin pole to attach booms and A-frames, if not of the self-raising type. It may be well for the customer to check with the shipper on the method of loading and the location of the boom on the car, or which of several attachments shipped is to be in position for initial mounting on the machine.

Railroad clearances may require the removal of crawler shoes only, or the entire crawler frames or parts of the cab and A-frame. If shipped with crawler frames removed, it may be best to ship with the axles parallel to the sides of the car so that the machine can be run off crossways with a minimum of ground cribbing.

The side-girder of the car must be blocked to prevent the car from tipping when unloading over the side. It is hazardous to swing the machine without the boom at-

(Continued on page 90)

For most efficient internal vibration of concrete get VIBRO-PLUS

—the VIBRATOR THAT USES ITS HEAD!

The Vibro-Plus ROLLGEAR vibrator head steps up low shaft speeds to high vibrating speeds —11,000 to 15,000 per minute.

Because it vibrates at such high speed, Vibro-Plus compacts concrete more effectively, more rapidly, more economically.

Because motor and shaft speeds are low, a smaller motor may be used—shaft life is longer—maintenance is less. Thus you get more effective, more dependable performance—at lower operating cost. *ROLLGEAR* is the reason—and only Vibro-Plus has this patented vibrator head. Write for bulletin and nearest distributor.

TYPE ERSB is electrically operated, using a 1 HP 110/220 V. single phase or 110/220 V. 3-phase fully enclosed motor on a swivel or skid base. 20 or 30 ft. flexible shaft connects with snap coupling, and can be lubricated in 15 seconds even while running. The ROLLGEAR head is available in 1¾", 2 5/16" or 2¾" diameters. Shaft and head can also be used with gasoline or pneumatic drive. Grinding attachments available.

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BUCYRUS ERIE

BLUE shale so hard it often had to be shot and ripped before loading . . . scraper maintenance costs way up, yardage output down . . . pushers not used to avoid damage to scrapers. That was the picture on a tough highway job until one of the contractor's International TD-24 Tractors was teamed with a Bucyrus-Erie B-250 scraper. Look what happened when the Big Red team went into action.

On a 60-day run, this 22-yd. outfit not only scraped out heaping loads of shale, but did it without blasting. Big Red team loads averaged 13.5 to 20% higher than competitive units — and two of these scrapers had greater apparent rated capacities than the B-250. Loading time of the B-250 averaged 1¾ minutes with a pusher. In spite of heavy shock loads, the B-250 showed no signs of failure.

This is one of many jobs on which the Big Red team has performed with complete satisfaction to the owner. Performance details on this job, or any other job on which records have been carefully compiled, are yours for the asking. Study these records . . . and let us demonstrate the Big Red team *on your own job.* Then you'll have convincing proof that this combination gives you the ultimate in crawler tractor earthmoving performance.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

248T21C

TEAM

On Million-Yard Highway Project

Even the tough blue shale on this western highway job couldn't stop the B-250 from getting heaping loads. This scraper was also used for finishing on the job because it did such an excellent job of spreading.

See Your INTERNATIONAL

Industrial Tractor Distributor

EARTHMOVING . . . Continued from page 87

tached, especially if the crawlers are off, because it may tip over. Large jacks and heavy pull hoists are time-savers in unloading a heavy machine.

Before starting the engine, the usual precautions on checking lubricants, water and fuel must be exercised. The operator must be sure of traction brake and clutch operation. Crawler tracks may require loosening because they usually are made quite tight for shipment. They should be loosened before moving the machine.

The vigorous vibration and jolting during shipment may have shaken bolts loose; adjustments may have changed; parts even may have fallen off. Washers or screws can fall in between a clutch or brake lining and its drum, which would cause the drum to score if not removed. The machine and its attachments should be inspected carefully before unloading. Check bolts and screws for tightness. Damage and shortages should be reported at once to the freight agent.

• **Moving to job**—If a crawler machine is to move far, the crawler bearings should be greased every mile or so. It may be advisable to pour oil on the track pins and drive sprockets when a new machine is being moved for the first time.

• **Starting up—**

(1) *Hire experienced operators,* especially when starting up a new machine. A good operator can get the greatest output with the least strain on the machine. He can make cables last longer. He will have fewer accidents.

(2) *Make sure of proper oiling and greasing.* Have a check list on fittings, at least for the first few greasings. If some fittings are missed repeatedly, trouble will result. Be sure your operator and oiler know their jobs and then that they do them carefully. Watch open-gear greasing.

(3) *Take it easy at first.* New gears have some machining roughness which needs burnishing under moderate loads. Gear tooth surfaces work-harden under moderate loads to withstand heavier loads later without scoring or pitting. Bearing surfaces have an opportunity to run in or wear off the microscopic high spots or ridges left after machining or grinding under light loads, so that they will later carry heavier loads without heating or scoring.

(4) *Prevent overloads.* The safety valve of a power crane or shovel is the clutch. When the machine is started for the first time, clutches should be adjusted so they will slip before the engine begins to be slowed down. Operating with loose clutches for a few days may not allow the operator to get full capacity, but it will pay off in lower maintenance.

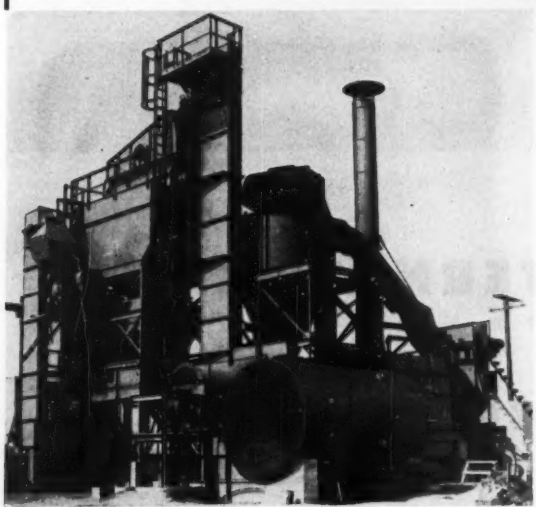
However, main clutches should not slip so much that they become overheated. When the load stalls, ease off and take another bite. As clutches wear in, the surface and friction may improve and the clutch becomes more powerful so it may be necessary to back off farther the power spring, heat compensating spring, air pressure, or band adjustment, depending on the make or type of clutch.

New cables, which have a safety factor of at least three or four times the full engine horsepower pull,

(Continued on page 92)

100 TONS PER HOUR CONSISTENT PERFORMANCE

CUMMER ASPHALT PLANTS



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- Equipped with cold storage bin and feeder.
- Internal combustion with low pressure burner equipment.
- Dust collector discharging reclaimed dust into hot elevator.
- Power—diesel or electric.
- Plant is complete with all motors and starter switches.

Other sizes from 50 to 100 tons per hour (complete drying and mixing units) available.

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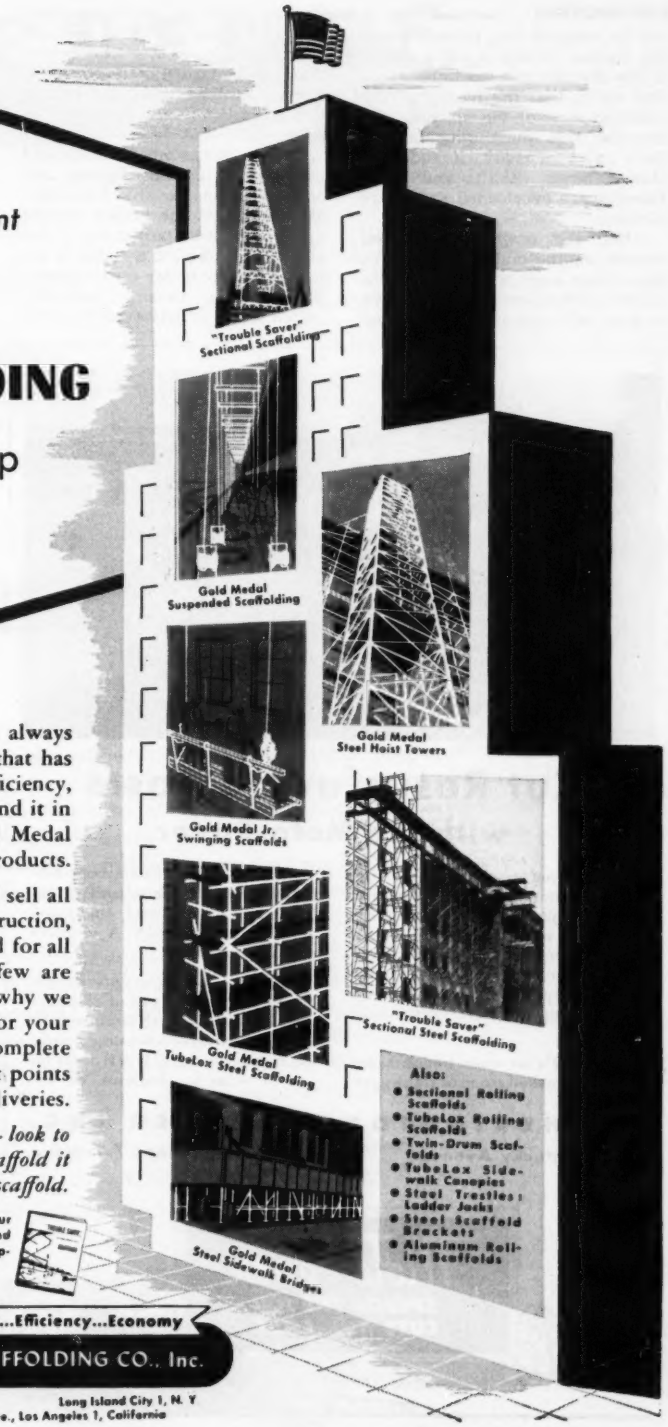
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can be snapped like threads when the bucket strikes a solid object if the clutches are too tight. This fact shows that the inertia of the rotating parts of the machine can increase line pulls way beyond their rated capacity, if suddenly slowed down. Shafts and gears likewise are overloaded and overstressed.

After the machine has been broken in, the clutches should be kept loose enough so that if the bucket strikes something solid, the engine will continue to run and slip the clutch for several seconds before it stalls out. The operator normally releases the load before the engine stalls, but the greatest damage is done when the bucket first stops before the operator can react.

The clutch has more friction and power when it is not slipping, and once it begins to slip load falls off. So, to get the bucket started again it must be pulled out of the obstruction. Yet, if a clutch is allowed to slip under normal loads it overheats, causing excessive clutch wear. It may even overheat the brake drum (which usually surrounds the clutch drum) sufficiently to cause brake lining to fade to the point where the operator cannot hold the load on the brakes.

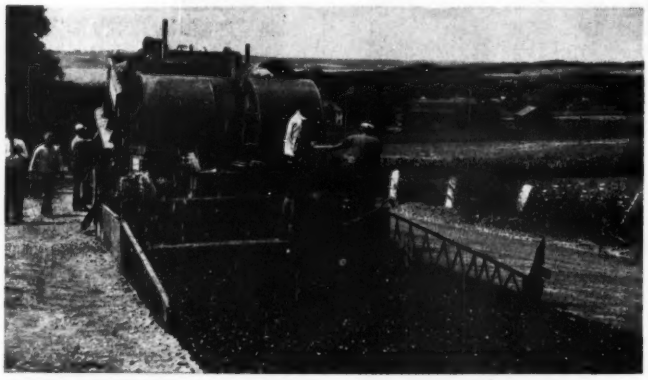
Overloads on swing and traction clutches also should be limited by careful adjustment. Swing clutches heat more than others because they must slip more, especially in stopping the swing. Probably 1½ or 2 times as much heat is generated in stopping the swing as in starting. Even with relatively high temperatures, life of the proper type of swing clutch linings can be good.

Clutch drums expand with heat and, since the drum gets hotter than the band and linkages, an internal band clutch will loosen with heat and an external band tighten with heat, unless there is provision for heat compensation. Hence final clutch adjustments should not be made until the drums are near operating temperature. Disk-type clutches may be less sensitive to expansion, but usually have less heat radiating surface and can more easily overheat. Excessive temperatures cause fading which, in turn, means more rapid wear. Some grades of linings recover well after overheating. Others do not, requiring wearing away of a scorched surface before they become normal. If linings are "too wear resistant," they may glaze causing hard operation.

Dragline and clamshell operations with extra long booms and heavy counterweights on short swing cycles are toughest on swing clutches. Overloads on boom suspension cables, pendants and the boom are reduced by moving the boom slowly when it is on the ground. Heaviest loads are encountered with long crane booms just as they are being lifted free of the ground. Sudden starts are bad. Also, sudden stops on lowering the boom are damaging, especially when it is down at a low angle.

• • •

Ed. Note: The fourteenth article in this series will appear in the February issue.



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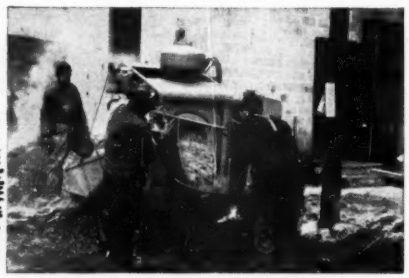

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Legal Decisions Concerning Construction

The Wrong Delivery

THE CONTRACTOR kept his trucks and his personal car in a garage a few blocks away from the apartment building which he was erecting, each night the garageman gave out the usual identification slip, the contractor presented the slip the next morning, and got his car.

On a certain morning the contractor presented the slip, found his stall empty, and the garageman was forced to admit that he had delivered the contractor's car to a gypsy fortune teller whose slip called for a Ford of the vintage of 1918.

Both gypsy and car had disappeared, the contractor sued the garageman for the value of the car, and the Utah Supreme Court decided in his favor in a case reported in 231 Pacific Reporter, 445 as Potomac Ins. Co. v Nickson.

"A misdelivery of property by any bailee to a person unauthorized by the true owner is of itself a conversion rendering the bailee liable in trover, without regard to the question of due care or degree of negligence. This is a well established legal principle, applicable to every description of bailment. The action of trover is not maintained by proof of negligence, but only of misfeasance amounting to a conversion. And a delivery to an unauthorized person is as much a conversion as would be a sale of the property, or an appropriation of it to the bailee's own use. In such cases neither a sincere and apparently well-founded belief that the tortious act was right, nor the exercise of any degree of care, constitutes a defense even to a gratuitous bailee," the court said.

The Garnishee Tangle

THE CONTRACTOR had sued an owner, got judgment, ascertained that Jones owed the owner $3,450, "garnisheed" Jones to have the debt applied to his judgment, and ten minutes after the garnishee order was served, Brown also garnisheed the same debt.

"I'm not going to take any chances on paying the wrong one," Jones assured himself, filed an "in-

terpleader," asking the court to decide which of the two claimants was entitled to the debt, and the court ruled that the debt was not payable to the owner at all, and was really payable to Smith, an outside party.

Then the contractor approached Jones.

"Now, you go ahead and pay the debt to me, and I'll give you a bond to stand between you and all harm," the contractor proposed, after explaining the whole situation.

"I'd be willing to do anything I could to help you out, but according to your story, the court has already ruled on the interpleader that I don't owe your owner at all, but really owe the third party," Jones demurred.

"You weren't served with any notice of the interpleader?"

"Didn't know about it till you told me."

"Well, my lawyer tells me that where you weren't notified of the interpleader proceedings, the decision of the court on that point is not binding to you," the contractor explained, and the United States Supreme Court has so ruled in New York Life Insurance Co. vs Dunlevy reported in 36 S.C.R. 613.

"The interpleader is an altogether different matter from the garnishee proceedings. This was an attempt to bring about a final and conclusive adjudication of personal rights—not to discover property and apply it to debts. And unless in contemplation of law Jones was before the court and required to respond to that issue, its orders and judgment in respect thereto were not binding on him," said the Court.

The Short Delivery

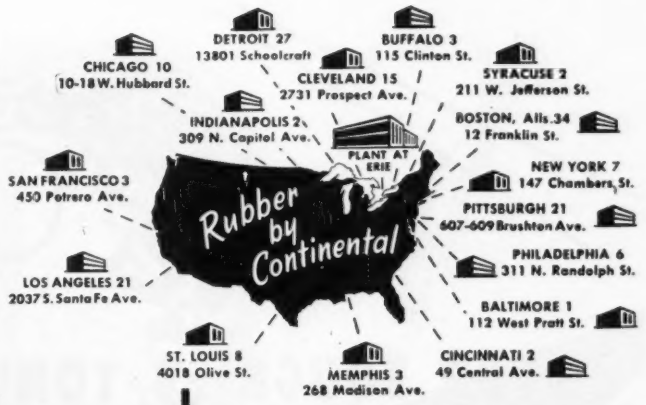
THE SALESMAN was a hustler, the contractor was anxious to buy, and such a combination produced the expected result. The salesman left the contractor's office with a large and diversified order.

In due time the order arrived at the freight office. From the size of the shipment the contractor suspected that only part of his order had been shipped, and upon closer examination his suspicion was fully verified.

"Much of my order is missing and I refuse acceptance and payment until the remainder is delivered," was the text of the contractor's letter to the jobber.

"Sorry; unable to deliver re-

(Continued on page 97)



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"We pay more for Homocord, but it costs us less!" • That's what users say . . . and they won't take any other conveyor belt. It makes sense, too. Where tonnage is toughest, Homocord has been known to outlast 2 or 3 ordinary conveyor belts. Figure cost of belts, plus cost of repeated installations, and Homocord proves the biggest bargain you can get • Its special construction—cushioned and flexible—absorbs impact that other belts can't take. Send for Bulletin 6906 and read about the Guillotine Test that proves our point • The same engineering goes into our hose, V-belts and flat belts. Get your Manhattan representative to show you.

R/M

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Packings • Brake Linings • Brake Blocks
Clutch Facings • Asbestos Textiles • Sintered Metal Parts • Bowling Balls

mainder; request payment delivered portion," was a shortened version of the jobber's reply.

Then the contractor decided that he would not accept and pay for any part of the order, and wrote the jobber to that effect.

The jobber stood his ground, sued the contractor for the price of the supplies actually shipped, and was sorry that he did, as the courts of Maryland, Illinois, Indiana, New York, Michigan, New Jersey, Wisconsin, and the Supreme Court of the United States have decided that a buyer need not accept a shipment unless the entire quantity is shipped, and that if the seller delivers a smaller quantity, the buyer may reject or accept at the buyer's option.

This decision can be found in Cleveland Rolling Mill *vs* Rhodes, as reported in 121 U. S. 255.

The Collateral Note

THE CONTRACTOR had taken his customer's three-month note, and also took a note of a third party payable to the customer, by way of collateral security. Later on the contractor endorsed both notes to a creditor, and the creditor handed the collateral note to the customer for collection.

"This note's payable to you. You collect it and hand over the money to me," the creditor suggested. The customer collected the note in due course but pocketed the proceeds.

Then the creditor threatened to sue the contractor on his endorsement of the original note.

"Return the collateral note, and I'll pay you," the contractor agreed, and the creditor explained what had happened to the note.

"Then, if you can't return the collateral note, you can't collect on the other," the contractor contended, and the Supreme Court of South Dakota in Nissen vs Ewers reported in 210 N. W. 713, ruled in the contractor's favor.

"It would seem that a statement of the fact if sufficient, and certainly any extended discussion of the issues or citation of authorities is unwarranted. When the creditor took the note, he became responsible to the contractor, either for the return of the note to the contractor upon the payment of the principal note, or in case the principal note were not paid, then it became his duty to collect the collateral note and credit the contractor with the proceeds," was the reasoning of the Court.

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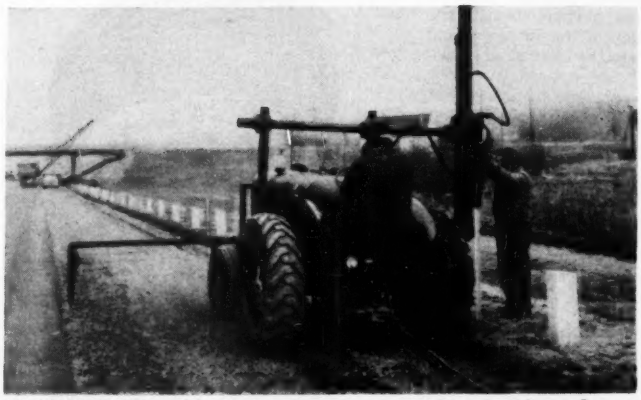
RUBBER-TIPPED
VIBRATORS
EXTERNAL VIBRATORS
AIR CLAMPS
VIBER
Leadership starts on the drawing board...
where new products are constantly being developed to furnish you a complete line of superior vibration equipment.
and is proved in the field... where greater performance, more years of efficient work at low cost operation have made Viber standard equipment with leading contractors throughout the world.
Please write for Viber's new illustrated catalog on its standardized line and new products.
VIBER COMPANY
Concrete Vibrators Since 1931
Dept. 54 726 South Flower Street • Burbank, California

Machine Drives Safety Stakes... 35 per Hour



REFLECTOR STAKES to delineate New Jersey Turnpike are driven by Schramm Pneumatractor fitted with concrete breaker that rides drill guide from wagon drill. Correct location for driving stake is determined by feeler gage to pavement edge and by drag chain.

TO MAKE the New Jersey Turnpike super-safe, it is delineated in both directions by reflectors every 150 ft—a total of 8,500 on the 118-mi road. To make the delineator installation super-speedy, American Gas Accumulator Co. is driving the reflector stakes with a paving breaker on a tractor-compressor, and its small crew betters 35 units per hr—a total of 375 in the best 9-hr day.

Stakes are a formed U-section 7 ft long, weighing 1.2 lb per ft, made of Armco Zinc-Grip (galvanized) sheet. They are driven 12 ft 9 in. off pavement edge, with their tops 42 in. above pavement grade. Thus, allowing for shoulder slope, not quite half the stake is embedded in the ground.

The stake-driving unit is a Schramm Pneumatractor with a cantilever bar carrying a wagon-drill guide fitted with a paving breaker as a hammer. A rack on the front of the machine holds a supply of stakes, a feeler gage gives correct distance from pavement edge, a 150-ft chain dragging behind shows stake spacing, and match marks on hammer and guide indicate driving depth.

A three-man crew works with the rig. One drives the Pneumatractor and positions it along the shoulder, one sets the stake in the drive head (specially designed to hold the stake at the proper horizontal angle for best reflection) and operates the hammer, one acts as rear chainman. This last man is eliminated when stakes are driven on the second side of the road, the hammer operator lining each stake up by eye with its opposite number across the highway.

Two men follow the driving crew, installing delineator heads on the stakes with vandal-proof aluminum nuts. Delineators are a single, high-intensity Stimsonite crystal reflector, except at deceleration zones where two-unit yellow reflectors are installed every 75 ft. On ramps at interchanges, single yellow reflectors are placed on a 40- to 75-ft spacing, depending on degree of curvature.

American Gas Accumulator Co., Elizabeth, N. J., is handling the safety installation for the New Jersey Turnpike Commission un-

(Continued on page 101)

STAKES ARE DRIVEN in a matter of seconds by self-contained rig. Here, stakes on other side of road are already driven, so hammer operator just sights across to spot this one without using chain.

STAKES ARE CARRIED on front of machine, and supply is replenished by truck as needed (see left photo). They come wired in bundles of five for easy counting and quick transfer to machine.

Crawler trencher digs 4′ ditch 7½′ deep with help of 68 TIMKEN® bearings

THIS Model 320 is reported to be the only crawler type trencher that can dig a 4′ ditch 7½′ deep at the rate of 10 to 12 lineal feet per minute. To keep its many moving parts operating, with minimum maintenance and time-out on the job, Cleveland Trencher Company uses a total of 68 Timken® bearings in the differential, transmissions and track rollers.

Timken tapered roller bearings take radial and thrust loads in any combination, hold shafts in rigid, positive alignment. Proper gear meshing and a smooth flow of power is assured.

Because they keep housing and shaft concentric, Timken bearings make closures more effective. Lubricant stays in, dirt stays out—reducing wear and maintenance.

Timken bearings provide extra load carrying capacity because of line contact between rollers and races. They normally last the life of the machine because they're engineered for the job, precision manufactured and made of special analysis Timken fine alloy steel.

No other bearing can give you all the advantages you get with Timken tapered roller bearings. Make sure you have them in the machines you buy, or the machines you build. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How **CLEVELAND TRENCHER COMPANY** mounts the track rollers of its Model 320 trencher on Timken bearings to assure long life and minimum maintenance.

WE MAKE OUR OWN STEEL

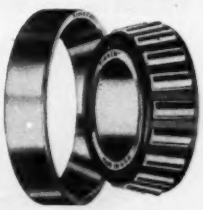
The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL — NOT JUST A ROLLER — THE TIMKEN TAPERED ROLLER — BEARING TAKES RADIAL AND THRUST — LOADS OR ANY COMBINATION

6 reasons why BUDA Dyna-Swirl DIESELS will increase your profits

1 12 to 18% more horsepower at normal operating speeds... heaped loads at higher travel speed.

2 10 to 17% more useable torque... greater lugging ability...less shifting...faster round trips.

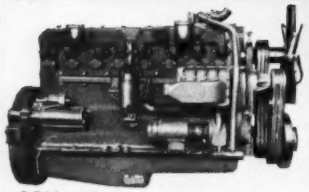
3 6000 or more operating hours between overhauls...more pay yards per hour of engine life.

4 Exclusive dyna-swirl combustion guarantees more horsepower per gallon of fuel...greater fuel economy.

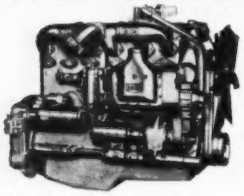
5 Clean, simple design; rugged construction; less "nick-nack" maintenance...more production time.

6 Smooth, quiet operation... less vibration...greater operator comfort.

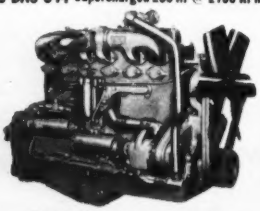
13 to 25% More Displacement!



8-DAS-1125 Supercharged 350 HP @ 2100 RPM



6-DAS-844 Supercharged 280 HP @ 2100 RPM



6-DA-779 185 HP @ 2100 RPM

You can see the definite money-making advantages built into Buda Diesels when you watch a piece of Buda-powered equipment work. Talk to the operator about performance—check operating and maintenance costs and you'll see why Buda Diesel owners call them "money-makers" in any equipment.

See your Buda Distributor today. He can give you all the facts. Write for Bulletins and Specifications. *The Buda Company, Harvey, Ill.*

BC-13

a Power-Full and Dependable Name in Engines

BUDA

Manufacturers of Diesel and Gasoline Engines, Maintenance of Way Products, Lifting Jacks, Earth Drills and Material Handling Equipment

FASTER STAKE DRIVING ...

(Continued from page 98)

der a contract of around $36,000. The firm originally planned to drive the stakes from the bed of a truck with a hand-held pneumatic hammer, but had to find a faster

HEADS ARE BOLTED to stakes by two-man follow-up crew to complete the installation. Heads carry 3-in. Stimsonite reflectors.

method to meet an accelerated schedule. With Schramm Inc., West Chester, Pa., it developed its present driving rig that has upped originally estimated progress by 80%. Now, AGA crew chief Quentin Warta and his total four- to five-man gang average more than 300 complete delineator installations each 9-hr day.

Wolf in Sheep's Clothing

KEEP UP YOUR GUARD during these cold winter months against carbon monoxide leaking into vehicle cabs or other enclosed, occupied areas around equipment with internal combustion engines. The National Safety Council states that CO from the exhaust of motor vehicles alone takes 250 lives a year. You can't see it; you can't smell it; you can't feel it—but it is mighty lethal. The 250 fatalities result while vehicles are standing with engines running. There is no way of knowing how many drivers in moving vehicles have been put to sleep by this sneaky poison or the number of accidents resulting from such drowsiness. Every construction man knows how to prevent these fatalities. Enough said!

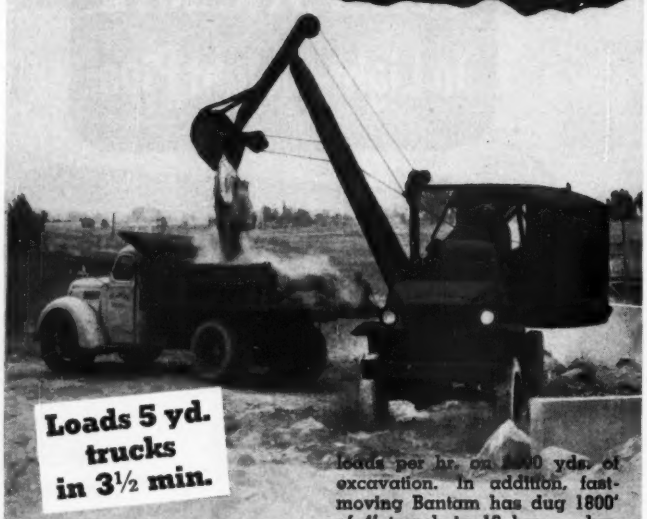
How NAYLOR gives you EXTRA STRENGTH in Light-weight Pipe

If you want to know why Naylor pipe out-performs other light-weight pipe on construction jobs, here is just one of the reasons. If you could look inside Naylor's distinctive spiral, you would see the lockseam spiralweld structure which extends in spiral form throughout the length of the pipe. This spiralwelded truss provides greater structural strength —under pressure, compression, collapse, and beam load than any other iron or steel pipe of the same nominal wall thickness. That's why you can use Naylor Pipe on jobs normally requiring heavier-wall pipe. Write for Bulletin No. 507.

NAYLOR PIPE

Naylor Pipe Company
1268 E. 92nd St., Chicago 19, Ill.
New York Office:
350 Madison Ave., New York 17, N.Y.

BANTAM® handles tough rock excavation *in a hurry!*



Loads 5 yd. trucks in 3½ min.

Digging in heavy blasted lava rock, this low-cost ⅜ yd. Bantam Trench Hoe recently handled 500 cu. yds. per day on Memorial Hospital expansion job for Rex Johnson Excavating Co., Irvin Falls, Idaho. Operating on 13-second cycles, with 45° to 90° swings, Johnson's Bantam averaged ten 5-yd. truck loads per hr. on 4,500 yds. of excavation. In addition, fast-moving Bantam has dug 1800' of 4' trench in 10 hrs. . . . has handled scores of scattered basement and pioneering jobs during the past 18 months, with only minor repairs. No wonder Operator John Brown exclaims, "Bantam is the most mobile and all-around satisfactory machine I've ever used." For more facts, see your Bantam Distributor, or write Schield Bantam Co., 221 Park St., Waverly, Iowa.

SB-MC-1

EVEN IN ROCK, Bantam's high-speed mobility lets you handle more jobs at higher net profit.

SCHIELD BANTAM

Cranes • Excavators

Get more jobs done at lower cost

SAFETY . . . Continued from p. 51

tion contests. (We are happy to tell our men that we are enrolled in the Associated General Contractor's of America's annual contest.) And he should be told of the competition between foremen and superintendents in the firm so that

"The foreman should check with him to make sure that he knows how to perform the task assigned to him—in a safe manner."

he may get the feeling that he is participating in a team effort.

• **He should be cautioned,** particularly if he is working around mechanical tools, that it is these jobs —where a great deal of repetition takes place—that cause many accidents. It is the job that we can do *best* that leads us to relax and oftentimes creates an accident.

• **Make him realize** that he must assume personal responsibility for his own safety and take pride in the safety record being establshed on the job.

6. Safety in Actual Job Operations

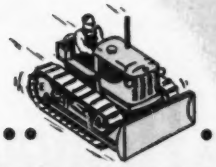
On-the-site operations can be handled in various ways but it is essential that the following suggestions get full play:

• **Lack of enforcement** of safety rules by contractors is a glaring deficiency. It would be of little avail to spend time reciting the various rules and regulations of federal and state agencies for construction operations. These rules should be well known and we assume they are second nature to our supervisory personnel. It is enforcement alone that will bring about compliance with these rules on the job.

• **A "Tool Box" safety meeting** is extremely effective on the job. Tool Box meetings usually are called by

(Continued on page 105)

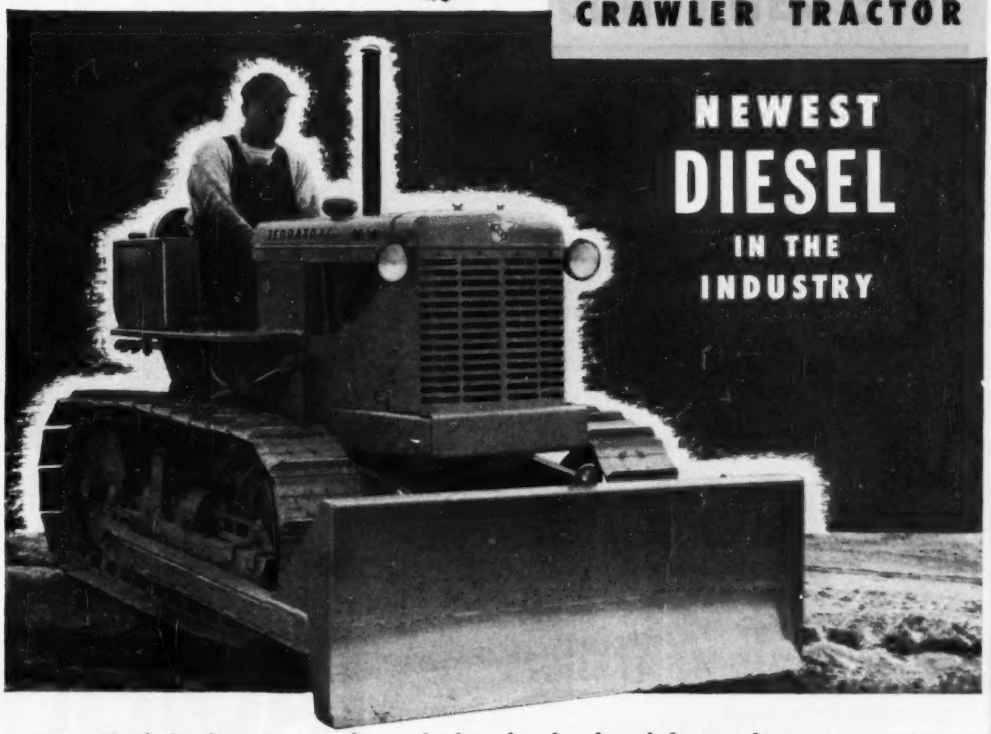
It's here!.....



TERRATRAC

....*new* DT-34

CRAWLER TRACTOR



NOW—all of the features you knew *had* to be developed for earth moving equipment

ARE FOUND IN BIG TERRATRAC DT-34 BUILT FOR BIG JOBS

Everyone is praising the Power, Speed and Maneuverability of the new Terratrac DT-34. Wide Track Shoes, Heavy Links and Large Idlers give the DT-34 the backbone to do the work of crawlers almost twice its price.

New Terratrac Bulldozers, Angle Dozers, Loaders and Winches have been specially designed to take full advantage of the power and stamina of the DT-34.

cuts costs!

AMERICAN TRACTOR CORP.

Write today for details

DEPT. CE-12, CHURUBUSCO, INDIANA

Please send me full information about the new DT-34 Terratrac and the name of my nearest Terratrac distributor.

Name_____

Company_____

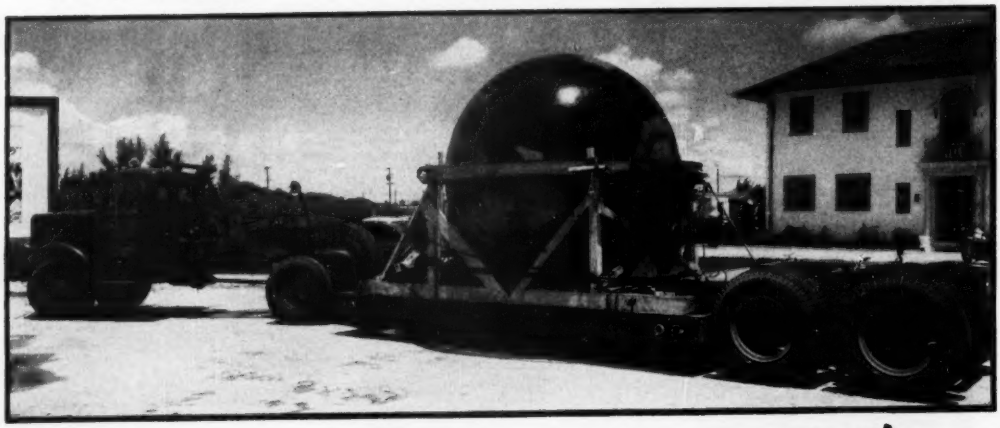
Address_____

City_____ State_____

The Man* Said

*Leonard Brothers Transfer of Miami, Florida

"We can't move Heaven and Earth



...but we can move the world"

with

TALBERT

removable gooseneck* trailers!

Talbert Trailers feature:

- Minimum empty weight—maximum payload
- Front end loading—no rear bridge, short boards, minimum blocking, etc.
- Light-weight Removable Gooseneck*—no moving parts
- Fast, easy, safe one-man operation
- Large "production-priced" tires—interchangeable with tractor tires
- Spring tandem suspension—for high road speeds

Leonard Brothers Transfer used their Talbert Trailer to move this 12' diameter, 6500-lb. globe of the world for the Dade County, Florida Port Authority.

THE TALBERT CONSTRUCTION EQUIPMENT CO., of Lyons, Illinois manufactures a complete line of low-bed trailers and dump semi-trailers

THE TALBERT-WAY IS THE EASY WAY

'US' on-the-job power cuts costs

Where high line power is not available, "U.S." power plants can speed your work—cut your costs. *Whatever* your electric plant needs, there's a "U.S." unit to fit the job.

Write for information

U.S. UNITED STATES MOTORS CORP.
602 Nebraska St. Oshkosh

Ask the men who live with wire rope...

They insist on genuine

CROSBY CLIPS

Drop-forged
Hot dip galvanized
SIZES FOR ALL WIRE ROPE
DISTRIBUTORS EVERYWHERE

AMERICAN HOIST & DERRICK CO.
ST. PAUL 1, MINNESOTA

SAFETY . . . Continued from p. 102

the foreman for his gang for a few minutes when the day's work begins. He can spend 5 or 10 min with his group in the morning highlighting some particular hazard to be encountered during the day or some general hazard of the job. This type of meeting can be held once a week in addition to the regular monthly meeting. These few minutes pay great dividends in accident prevention.

• **Unsafe acts of employees,** rather than unsafe conditions, cause a great percentage of accidents. This directs us to concentrate our efforts where they are needed — on employees. Accident prevention, for the most part, revolves around a personnel problem and it becomes the responsibility of the foreman to help overcome it. Foremen are more closely associated with employees than anyone else and are in a better position to know them and deal with them. Foremen should be impressed with this responsibility and assisted in the effort to help their gangs work safely.

In this connection, we send to each foreman monthly one of a series of 12 pamphlets entitled "Safety in Foremanship." These pamphlets (published by the National Safety Council), together with a letter on safety are mailed to the foremen at their homes.

• **Foremen invariably offer the excuse,** "What can I do? I can't watch my men every minute."

However, if you ask them who in their gang is going to be hurt next they will pause a moment and tell you about some "lunkhead" who has difficulty in staying out of the way. When a particular job is done requiring special skill or experience, the "lunkhead" usually is kept out of harm's way. This is a safety rule which foremen follow unknowingly in many instances. It should be encouraged.

• **Care, use, and maintenance** of equipment and machinery to be used on the job must be discussed with the foremen and all information passed along by them. The hazards involved in the use and presence of the various pieces of equipment should be made known to all personnel and appropriate signs posted to warn of particular dangers. Employees should be instructed in the use of any new or unusual equipment or tools before they are allowed to operate them.

• **An unnecessary number of fa-**

(Continued on page 106)

HOW TO HANDLE WET JOBS

#1 of a series

NASSAU COUNTY INTERCEPTOR SEWER

Contractor: Hendrickson Bros.
Valley Stream, N. Y.

120 FT LAID PER DAY—15 FT BELOW GROUND WATER TABLE

WORK GOES FAST when water goes fast, as shown by these over-all averages on a troublesome wet job! The speedy progress was maintained laying 5 miles of concrete pipe (36 in. to 84 in. diameter). Photo shows Griffin Wellpoint system on one side of 21-ft deep open-cut trench.

• Company has dewatered thousands of jobs with equally fine results. No wonder cost-wise contractors say, "To get rid of water, get in touch with Griffin." Let Griffin estimate *your* next job.

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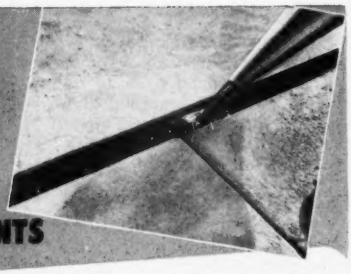
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

Servicised
HOT POURED
Para-Plastic*
FOR POSITIVE
SEALING OF ALL JOINTS



Para-Plastic prevents infiltration of water or other foreign substances under any expansion or contraction conditions of monolithic concrete.

Write for complete information on Para-Plastic for sealing any joint.

- MAINTAINS BOND FROM 0° TO 180° F
- RESILIENT, ADHESIVE, ELASTIC
- ADHERES TO CONCRETE, STEEL, METALS, WOOD AND TILE

NOW! Para-Plastic JF

New type Para-Plastic JF for airfield and airport construction. Resists dissolution by Jet Fuel spillage or leaks. All other Para-Plastic features included. Ask for details.

*Para-Plastic is one of the many patented products developed for the Construction Industry by Servicised Products Corp.

SERVICISED PRODUCTS CORP.
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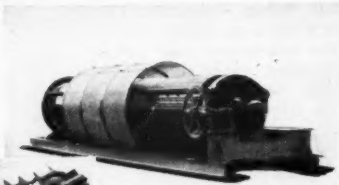
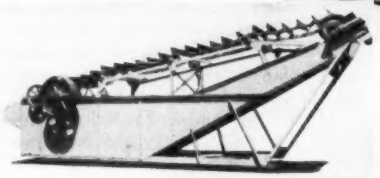
Clean sand, gravel at a cost that doesn't clean your pocketbook





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RELIANCE
UNITS OR COMPLETE PLANTS

Only proper screening and washing can cut costs—and that is where RELIANCE EQUIPMENT makes its reputation. These Units have been greatly improved in the past few years and today many regard Reliance as standard for best results. Let us tell you more about their smooth operation and rugged construction. *Write for Catalog 48.*

RELIANCE PRODUCTS
still available at moderate cost
Rock Crushers, Bucket Elevators, Revolving Screens, Storage Bins, Pulverizers, Chip Spreaders, Heating Kettles, Bin Gates, Feeders, Belt Conveyors, Grizzlies, Air Separators, Sand & Gravel Spreaders, Wash Boxes.

UNIVERSAL ROAD MACHINERY CO.
KINGSTON, N.Y., U. S. A.
Distributors in all principal cities of U. S. A

SAFETY . . . Continued from p. 105

talities occur in connection with excavation operations, although it would appear that excavating is well regulated and the dangers known. The rules for shoring and the stay-bracing of unstable material should be enforced and no deviation allowed. Adequate barricading and lighting must be maintained for the protection of the public, as well as employees.

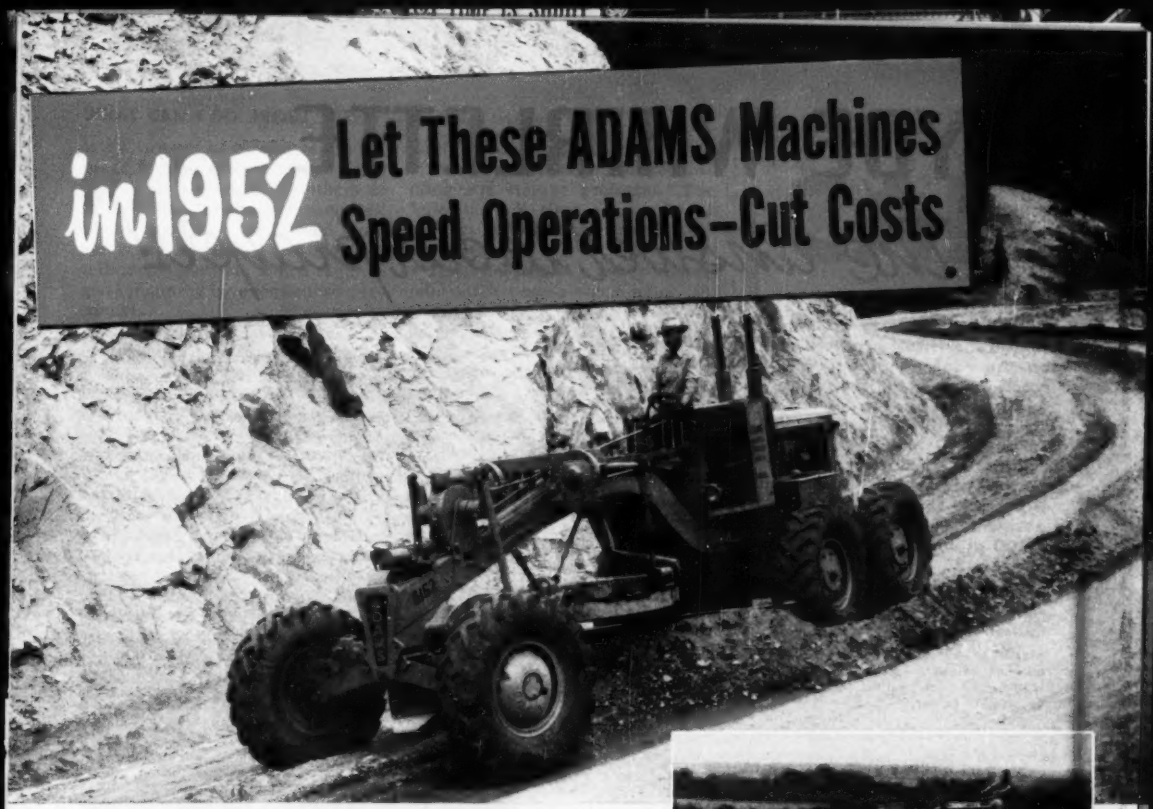
• **Concreting operations require planning** to insure progress as well as safe completion. Plan routing of buggies, layout of runs, operation of bucket and dump, setup and moving of chutes and inspection of forms while pour is being made. Consideration of concreting operations from a safety angle may save a man his life or save a form from letting go. Either situation would obliterate any saving in the per yd cost of pouring concrete which might be made by substituting speed for safety.

"Strange as it seems, carpenters more often than not, in building stagings for their own work, are not as careful as the average construction employee when he builds a staging for others to use."

• **Continual checking on stagings,** particularly those erected on filled ground, is necessary to avoid serious falls. Strange as it seems, carpenters more often than not, in building stagings for their own

(Continued on page 109)

in 1952 Let These ADAMS Machines Speed Operations—Cut Costs



Adams Pull-Type Graders—Most complete and up-to-date line on the market. Available in 8, 10 or 12 ft. blade sizes—power or hand controlled—with or without scarifier.

Here's a real time-saving, money-saving clue for '52 . . . For highest production—at lowest cost—you can't beat the world-famous, now better-than-ever, Adams line.

Adams Motor Graders, for example, are unequalled for performance-ability, long-life dependability and economy of operation and maintenance. Available in several popular sizes, all Adams Motor Graders, from largest to smallest, offer such outstanding advantages as *8 Overlapping Forward Speeds* • *High-Arch Front Axle* • *Positive Mechanical Controls* • *Wide Range of Blade Adjustments* • and many others.

You'll find Adams Pull-Type Graders and TraveLoaders equally outstanding—the most efficient and dependable machines your money can buy. Let your local dealer demonstrate how this great Adams team can cut costs and increase profits for you in '52.

Adams TraveLoader—High-speed, self-propelled, belt-type machine. Picks up and loads any kind of windrowed material. Has many unusual features not found in other loaders.

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA

Adams

Motor Graders TraveLoaders Pull-Type Graders

CLYDE WHIRLETTE

"the answer to our prayers!"

The erecting of steel for a fifth and sixth floor addition to an existing structure presented a difficult problem due to load limits on the roof. A Model W-3 Whirlette was recommended for mounting on a carriage which could be railed over the existing structure on the steel permanently placed for the beginning of the fifth and sixth floor additions. This accomplished weight distribution well within the load limits and made it possible for the contractor to permanently position beams weighing approximately 3,100 pounds.

Two new, Whirlettes

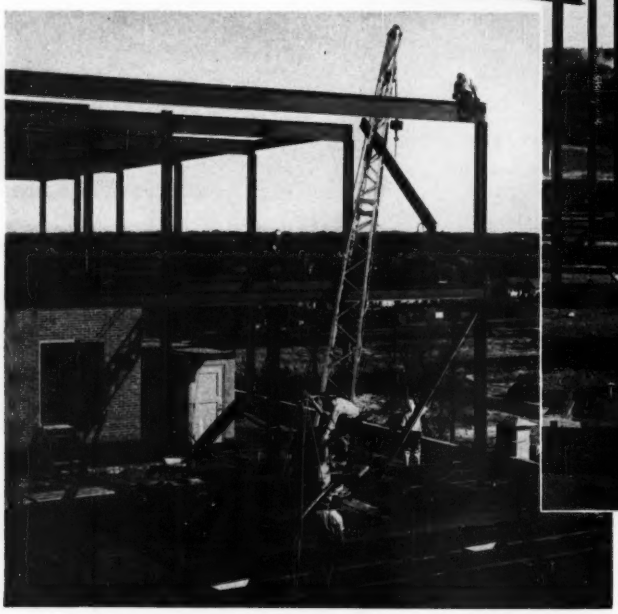
Model W-3 with double drum hoist, with or without power. 10,000 lbs. capacity. Maximum boom length 40 feet.

Model W-45 with two or three drum hoist, with or without swinger. 24,000 lbs. capacity. Maximum boom length, 60 feet. Either model available with gasoline or electric power.

. . . the contractor says--

"The smoothness and efficiency with which the Whirlette performs this feat has won the acclaim of all the iron workers who are connected with the operation and who have an opportunity to see the performance. To be very frank, it has been the answer to our prayers, particularly on this job."

J. J. Watson
Olson Construction Co.
Lincoln, Nebraska



Here the W-3 Whirlette sets steel for the fifth and sixth floors. The simplified controls on the Whirlette's hoist permits precision control for setting steel. The turntable has integral bull gear and center pin and a machined double taper roller path which permits full 360° swing.

WHIRLEYS • DERRICKS • HOISTS • BUILDERS TOWERS • CAR PULLERS • HANDI-CRANES • ROLLERS

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DULUTH 1, MINNESOTA

Subsidiary of Barium Steel Corporation

work, are not as careful as the average construction employee when he builds a staging for others to use. Framing operations when well planned can be performed both safely and efficiently. Setting up a mill is an operation which requires good planning by experienced personnel.

• **Masonry operations present hazards** which can be overcome by proper supervision. Insist on the use of goggles in the cutting of tile and blocks with masonry saws. See that the area under the person operating the saw is clean and dry. Watch the overloading of stagings. See that ladders are well made and properly fastened.

• **Encourage a weekly inspection** of your project by a three-man inspection party. My firm requires a weekly report from such a team, signed by the superintendent. The team is made up of a representative of the supervisory force and two mechanics or one mechanic and one laborer. The personnel of the inspection team is changed each week, and the men are required to sign a report indicating the hazards found, together with any constructive criticism they have to offer. These reports are reviewed at the main office and superintendents advised of pertinent comments, to the end that all hazards are removed so far as possible.

7. Promotion of Good Housekeeping

I do not believe that any other single phase of job safety work pays off as well as the promotion of good housekeeping. Not only are job hazards eliminated, but considerable savings are effected in waste elimination, protection of job materials and simplification of handling and storage problems. The following are cited as aids or as indirect benefits from good housekeeping:

• **Housekeeping is a never-ending job,** not a once-a-week affair. A clean job is a safe job; a safe job an efficient job.

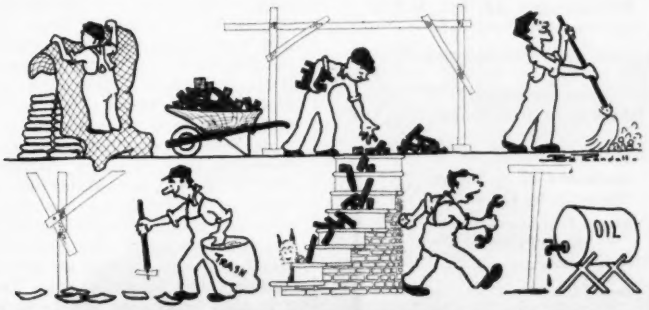
• **Housekeeping will do much** to eliminate the deep mystery of "material shrinkage." Constant clean-up generally will result in your knowing where every stick of lumber is on your job site. You will find this an important money-saver.

• **Good housekeeping will lend itself** to a smooth flow of material from one section of the job to another. A clean job does not leave unused material buried until it is needed, which then requires twice as many laborers to salvage it.

• **Efficiency in material handling** by reducing 2nd, 3rd, and 4th handling of stock is a direct result of good housekeeping methods. Continuous job clean-up insures that stripping, cleaning and moving of material will be a single operation rather than a series of labor-wasting "rainy day" jobs.

• **If a quick housekeeping survey** of your job is made daily it is almost unbelievable how many other conditions can be noted. On one particular job a labor foreman noted the following conditions in just 15 min while inspecting for housekeeping; uncovered and unprotected tile; uncovered, open storage of cement; fuel drum leaking on tarpaulins. Any one of these conditions could have developed into a loss far greater than the salary of the foreman for ¼ hr. True,

(Continued on page 110)



"No other phase of job safety work pays off as well as the promotion of good housekeeping. Not only are job hazards eliminated, but considerable savings are effected in waste elimination, protection of job materials and simplification of handling and storage problems. A clean job is a safe job; a safe job an efficient job."

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*TRADE MARK

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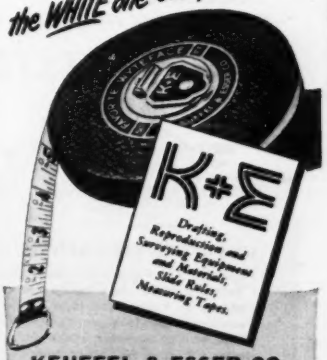

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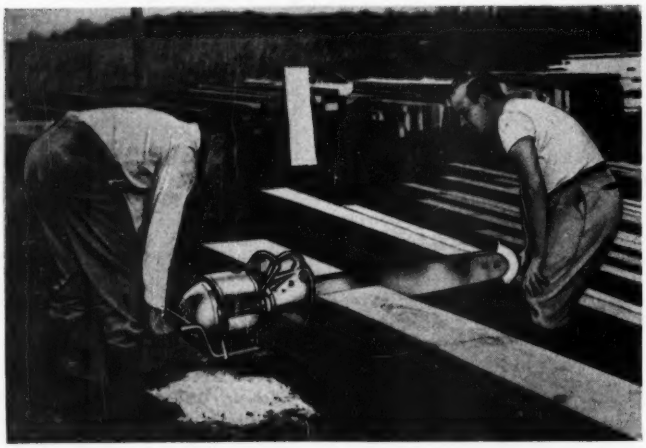
New! LIGHTWEIGHT 9 HP DISSTON INTERMEDIATE CHAIN SAW

that handles any woodcutting job!



Here's the power chain saw you've been waiting for—the new 9 hp, 2 cylinder Disston Intermediate Chain Saw, the DA-211. Powerful enough to handle any woodcutting job—yet its balanced light weight makes it easy to heft. It will give you many years of satisfying, trouble-free cutting power.

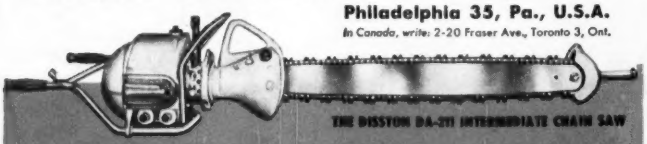
ALL-AROUND TOOL! The Disston Intermediate is perfect for right-of-way and line clearance, cuts mine props and bridge timbers with ease, has hundreds of uses in shipyards and on railroads, as well as for general plant maintenance.

LABOR-SAVING? And how! Time-saving, too. The DA-211 can do in a few minutes the work of an hour's manual sawing.

HENRY DISSTON & SONS, INC.

Philadelphia 35, Pa., U.S.A.

In Canada, write: 2-20 Fraser Ave., Toronto 3, Ont.



THE DISSTON DA-211 INTERMEDIATE CHAIN SAW

LOOK AT THESE GREAT FEATURES...

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Henry Disston & Sons, Inc. (Adv. Dept.)
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Please send me information on the 9 hp DA-211 Disston Intermediate Chain Saw.

Name_____

Street_____

City_____ State_____

2A

SAFETY . . . Continued from p. 109

these conditions are indirect housekeeping conditions, but they illustrate the savings that start with a clean job.

- **In relation to housekeeping,** there is also the protection of finished work. Have you had leakage spoil a new hardwood floor, or a newly rubbed concrete step chipped, or a finished floor gouged? These are a few of the headaches eliminated by purposeful housekeeping inspection surveys.
- **Accident figures show** that approximately 15 to 20% of accidents are caused by physical defects on the job. Good housekeeping will help you to eliminate this percentage since unsafe conditions do not long exist on a "clean job."
- **A clean-up crew** can't possibly take care of all the housekeeping. It's up to each man on the job to do his share, every hour of every shift. Everyone helps to save.
- **There are two primary rules** for good housekeeping: (1) Dispose of trash and loose objects; (2) pile materials and park tools and equipment where they belong. The rules are simple, but unless you give them attention, they won't work.
- **You can generally tell** how safe a job is by looking at it; even a "Sidewalk Superintendent" can tell. A messy job not only reflects upon the efficiency of the contractor, but also shows the lack of consideration for the safety of employees.

Plywood for the Roof

PLYWOOD SHEATHING to the tune of several million sq ft will be used as roof sheathing for the initial 5,000 homes in the 16,000-home "little city" of Levittown, Pa., under construction near the new Fairless plant of U.S. Steel at Morrisville. United States Plywood Corp., the supplier, claims that its new type fir plywood sheathing in 4x8-ft panels is stronger and insures better protection against the elements than ordinary lumber. U. S. Plywood's laboratores developed an animal blood and resin adhesive which is mold-resistant, extremely durable, and plywood fabricated with it can be stored outdoors for long periods. The firm also expects to supply some Redwood Novoply for interiors. Novoply is a three-ply laminate made of wood chips and flakes.

concrete UP by pipe line brings profits UP to you

With Rex® Pumpcrete®—concrete by pipe line—you have a real pipe line to lower costs—and hence higher profits. It's the pipe line *flexibility* that makes Pumpcrete the ideal method of concrete placement on so many large building construction jobs. Just spot the Pumpcrete in the one most advantageous position and extend the pipe line to the desired placement positions.

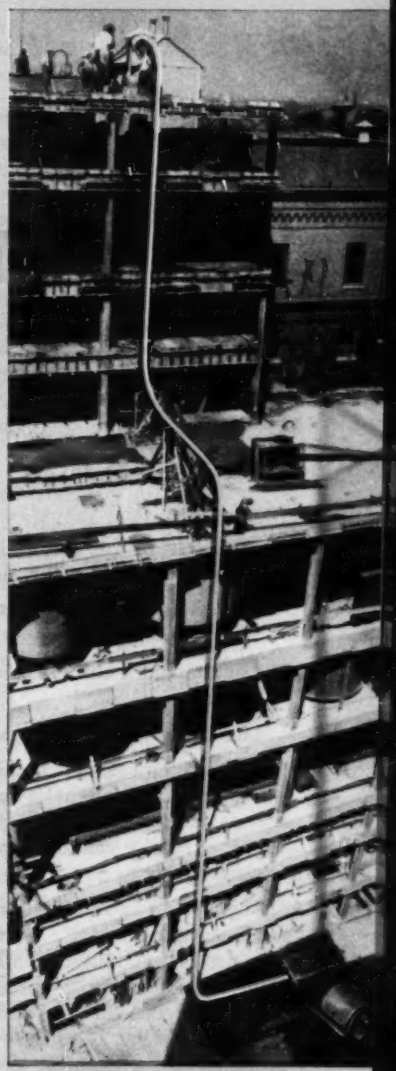
YOU SAVE FOUR WAYS:

FOURTH **YOU REDUCE NON-PRODUCTIVE MOVING TIME** With Pumpcrete you don't waste time and money moving mixing equipment from place to place. Just spot Pumpcrete in the one most advantageous location. No buggies, buggy runs or other heavy equipment to move. With Pumpcrete, you move placing equipment from floor to floor in as little as 15 minutes.

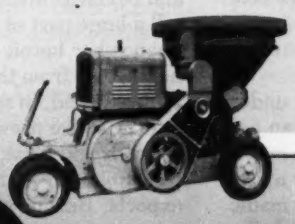
THIRD **YOU REDUCE "DEAD TIME"** With Pumpcrete, you place concrete while carpenters, form setters, electricians, plumbers are at work. Concrete is delivered steadily where and when you want it without interference.

SECOND **YOU REDUCE PREPARATORY COSTS** Pumpcrete and pipe line flexibility eliminate trestling, scaffolding, towers, expensive buggy runs and their costly re-handling.

FIRST **YOU REDUCE DIRECT LABOR COSTS** With Pumpcrete you transport, elevate and place concrete in one operation. No buggying is needed.



Nine stories high . . . 160 feet up! That's how high the Rex Pumpcrete lifted the concrete on this building job. Pumpcrete is ideal for pouring floors on buildings many stories high. As one floor is completed, the pipe line is extended to the next in as little as 15 minutes.



No matter how small or how large the area of each individual floor, pipe line flexibility pays off for you. For the complete story on how you can put up buildings for less with Rex Pumpcrete, see your local Rex Distributor or write to:

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HOW TO HELP BRITAIN ...and Ourselves

The purpose of this editorial is to help Winston Churchill obtain the aid Britain needs

(1) to weather her present financial crisis, and

(2) to avoid a chronic recurrence of such crises.

This is not a philanthropic purpose.

Britain is our staunchest ally in the free world's continuing fight for survival. She cannot perform her role effectively if she is broke, or if she careens from one financial crisis to another.

Then, too, a nation such as ours—committed to private enterprise as a way of economic life—has a special interest in helping Winston Churchill to help Britain. His administration is relatively friendly toward private enterprise. Should he fail, he would be replaced promptly by a Socialist government more hostile than ever. And that would weaken the standing of private enterprise in the free world.

Cause of the Crisis

It is the drive of the Western World under our leadership to rearm against Russian aggression that has precipitated Britain's financial crisis. It set off a scramble for raw materials from which armaments could be made, and for many other materials that might be short in the event of war. So the prices of the things that Britain must import—mostly raw materials—have been boosted more than the prices of things she can export—mostly finished products. That leaves Britain short of funds to pay for essential imports. This difficulty increases as the necessity becomes more urgent to divert industrial effort from production for export to production for security.

The Basic Trouble

Although Britain's immediate crisis was touched off by the rearmament drive of the Western World, her basic affliction is one from which she has suffered since the end of World War II. Stated in its simplest terms, Britain does not produce enough goods to pay her own way as one of the family of free nations.

For years this deficiency in home production was made up by income from shipping and overseas investment. But Britain had to sell a large part of her foreign investments to finance her heroic part in World War II. So her income from that source has been greatly reduced. And, in spite of an increase of about a third above prewar in her own production of goods and—thanks to a continued "austerity" program—a much larger increase in her exports, Britain still is not paying her own way.

Two Ways to Solvency

Britain has two ways to restore her solvency. One is to cut down on what is consumed—the belt-tightening process. The other is to step up British production.

To surmount the present crisis, Mr. Churchill has asked for some cutting down. He probably must ask for more.

Except as a stop-gap expedient, however, more cutting down of Britain's consumption is clearly a dangerous course. That would further depress a British standard of living which, not more than half as high as ours, already is too low. Politically such a course would grease the skids for Winston Churchill's administration, even now governing by a wafer-thin parliamentary margin. Also, as *The* (London) *Economist* remarks, the "lazy expedient of cutting trade" would result in "hurting other people and forcing them to take similar action"—by cutting the market for their products.

The Only Cure

The best and, in fact, the only way to help cure Britain's economic ills is to help Britain produce more. Here the technical possibilities are encouraging. On the average, the British industrial worker produces only about 40 percent as much a year as the American worker. That is a British estimate, made by Sir Ewart Smith.

Wider use of better industrial methods and modern tools and an infusion of the competitive incentive into British industry — to replace the cartel and other restrictive practices — would go a long way to narrow this wide gap in worker productivity. This is the consensus of experts on both sides of the Atlantic.

Since 1948 the Anglo-American Council on Productivity has done much to encourage output per man-hour in Britain and to foster this doctrine with both labor and management. But much yet remains to be done.

In the United States it is increasingly suggested that before we give Britain any more economic aid we should insist that everything possible be done to exploit the technical possibilities of increased production. This emphasis on production is needed. But if we Americans were to impose upon the hard-pressed British people conditions that could be construed as an affront to a friendly and sovereign nation, we might well put into the hands of a masterful rabble-rouser such as Aneurin Bevan, the anti-American leader of the Labor Party's left wing, a campaign issue on which to maneuver himself into the Prime Ministership.

Churchill Can Insist

But Winston Churchill is not so handicapped as we should be in imposing prerequisites of further aid. As Britain's own, most honored leader he will raise no touchy questions as to Anglo-American relations if he insists that Britain have firm plans to cure her economic ills, plans sharply focussed on ways and means of increasing Britain's industrial efficiency.

By presenting a convincing plan to cure Britain's recurring crises through greater production, Mr. Churchill will greatly facilitate the process of getting the aid his country must have. He will also remove an increasingly dangerous element of dissension in Anglo-American relations—the feeling of many Americans that more aid to Britain is more money down the drain. The way to counter that feeling is to come up with a prescription for an economic cure, not a request for another economic poultice.

Technically, such a program is entirely feasible. It will perhaps be the supreme test of Winston Churchill's statesmanship to make it politically feasible as well.

In the interest of Britain, of the United States and of the whole free world, we wish him all success.

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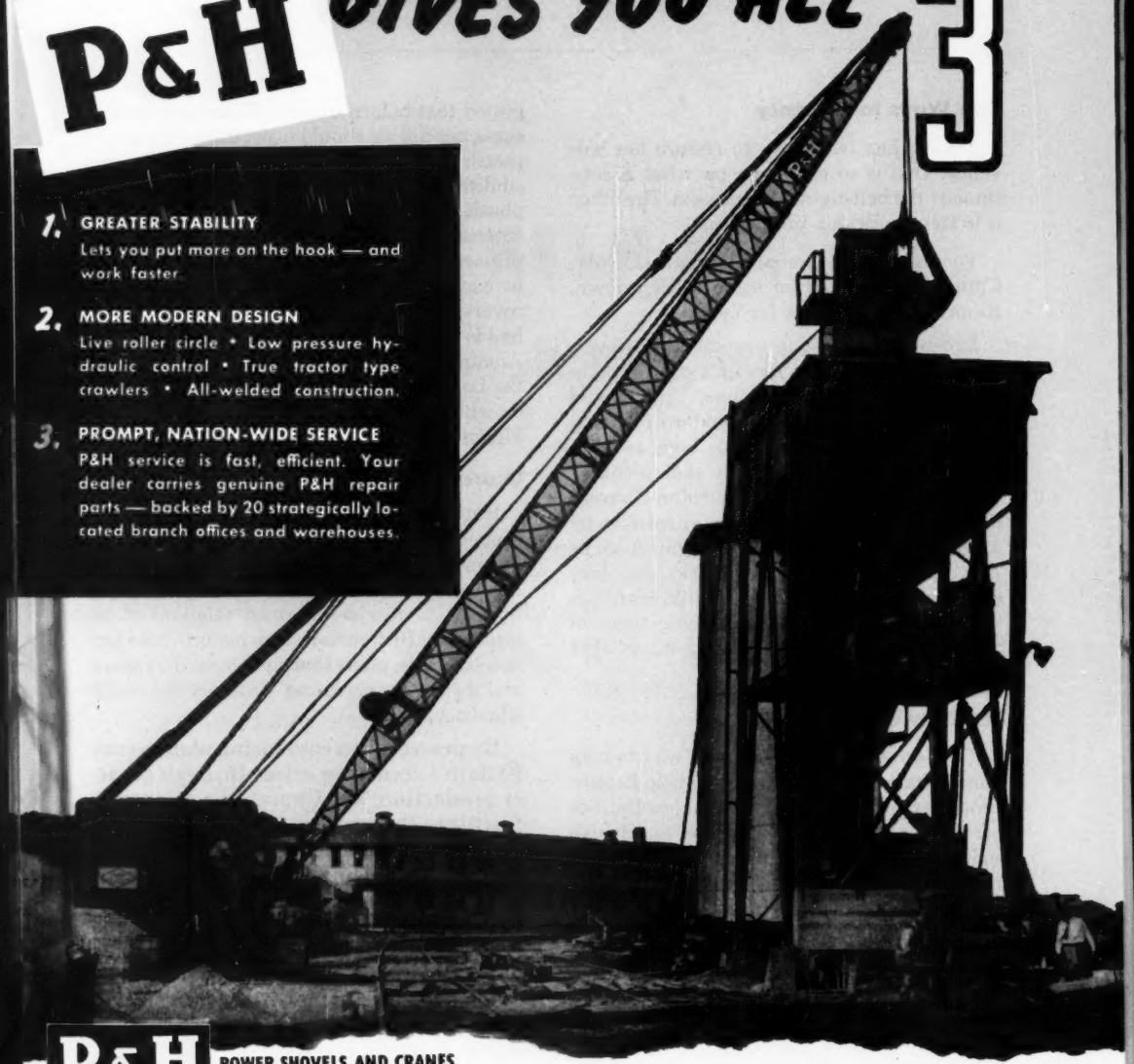

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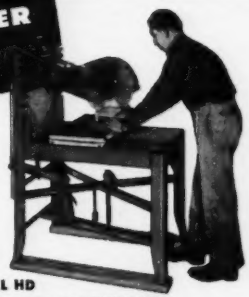
Four Entirely Different Ways to Profit with Handy CLIPPER "CONVERTIBLE"

④ **MODEL HD "CONVERTIBLE" CART used for TRACK SAWING**



② **MODEL HD used as WET MASONRY SAW**

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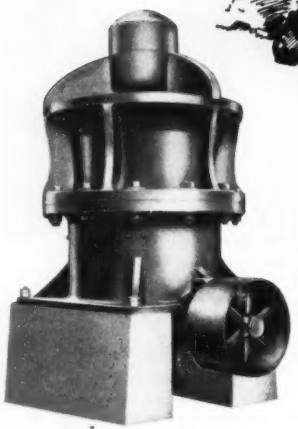

The Traylor TY Reduction Crusher is an example of how experience contributes to building superior machinery. All the details are in Traylor Bulletin 6112.

there's nothing new...

about producing aggregate on the job. In the 19th century, road builders regularly employed old men and boys to do this laborious work by hand.

Like the road builders of another day, modern contractors are finding it more economical and efficient to produce aggregate on the job. Traylor has been one of the main suppliers of rock crushing machinery for 50 years. In that time we have observed many revolutionary changes in aggregate production. And always, Traylor has been foremost in building the equipment to meet these changing conditions. It takes experience to build good rock crushing machinery. Traylor has experience . . . half a century of it.

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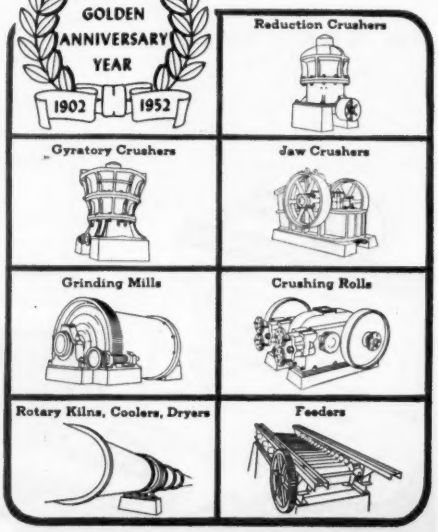

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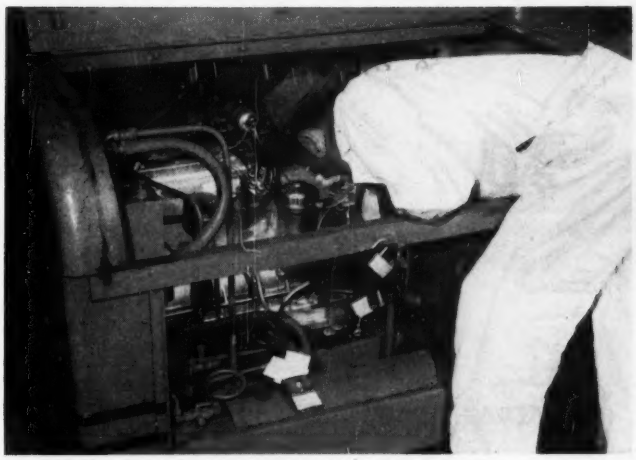

BATTERY AD-X2 being added to the storage battery in new construction equipment by Al Gavillet, maintenance foreman for Bay Equipment Co., Richmond, Calif., to increase normal service life of the battery. Compound also is said to revitalize and extend the life of many old batteries.

REJUVENATION of wet-cell electric storage batteries that no longer hold a charge has long been a dream of mechanics and chemists. And over the years numerous additives for storage battery electrolyte have been promoted with little success.

Now comes a mysterious white powder (another additive) which reportedly is surprising the skeptics. It is called Battery AD-X2; is manufactured by Pioneers, Inc., Oakland, Calif. Discoverer of the successful formula and president of the company is Jess M. Ritchie, a former construction superintendent.

First reports emanating from the San Francisco area, where AD-X2 got its trials in construction equipment, indicate that this compound to prevent sulfation of lead plates is doing the job.

Gordon Jaeger, maintenance chief for Dinwiddie Construction Co., San Francisco, has been using the powder in his firm's equipment for the last three years. He has records showing that the use of Battery AD-X2 has saved some 70% on battery replacement costs and around 80% on equipment down-time resulting from battery failures.

Al Gavillet, maintenance foreman for Bay Equipment Co., Richmond, Calif., reports that 40% of the batteries powering his company's rental equipment are close to three years old. He points out that batteries in contractor-owned equipment usually have a hard life, often are neglected and last about six months.

But, by comparison, batteries in machines rented to contractors really have it rough. His experience is that frequently such batteries receive no care on the job and are returned to the rental yard bone dry. He says the additive imparts long-life characteristics to his batteries, in spite of much neglect.

A third bay area construction man, Ed Bender, tells of his experience with AD-X2 in far places. As superintendent of equipment for the Bechtel Corp. on the American-Arabian pipeline job, he found that the substance quadrupled the life expectancy of lead-acid batteries.

Normal life for batteries on the Arabian desert is three months, due to high temperatures. Bender states that when his duties as superintendent were over, at the end of 11 months, the majority of the batteries treated were still in operation.

Application of the powder is simple. When batteries are treated in a piece of equipment, a package of AD-X2 is added gradually, washed into the cells with battery water. Then the engine is started

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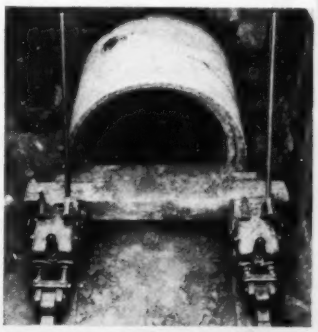

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Terrific Value...
IN EVERY CHANNEL OF OPERATION!

FAST WORKING and FAST TRAVELING of the UNIT 1014, provide the HIGHLIGHTS of PERFORMANCE. Features include: Twin hook-rollers . . . Tandem rear axles with full floating beam suspension, plus large diameter wide-faced air brakes on all 4 rear wheels. The equalized distribution of weight, allows short turning for close quarter operations and insures perfect balance. Equipped with hinged type boom for safe, easy travel. Road speed up to 32 MPH. Rated ½ yd. as an excavator, with a lifting capacity exceeding 10 tons at a 10 ft. radius, makes this a two engine equipped truck crane that can really withstand the impacts of heavy duty operations.

Send for a UNIT "TV SET"

You'll like this novel UNIT brochure. It portrays the complete UNIT line and illustrates the 10 reasons why UNIT is a better machine. Write for your copy today. There's no obligation.

UNIT CRANE & SHOVEL CORP.
6301 West Burnham Street
Milwaukee 14, Wisconsin, U. S. A.

Select
Your Favorite UNIT Star

- ★ UNIT 357 Mobile Type ½ Yard Excavator Crane up to 9 tons.
- ★ UNIT 614 Crawler Type ½ Yard Excavator Crane up to 8 tons.
- ★ UNIT 1020 Crawler Type ¾ Yard Excavator Crane up to 10 tons.
- ★ UNIT 1520 Mobile Type ¾ Yard Excavator Crane up to 20 tons.
- ★ UNIT 1014 Truck Crane ½ Yard Excavator Crane up to 12 tons.
- ★ UNIT 152OT Truck Crane ¾ Yard Excavator Crane up to 20 tons.

All Models Convertible to ALL Attachments.

UNIT

SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHOES • MAGNETS

Stang WELLPOINT SYSTEM

For KNOW-HOW ENGINEERING SUPERVISION EQUIPMENT *to keep jobs* DRY

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

JOHN W. STANG CORPORATION

2 Broadway, New York 4, N.Y. — 2123 S. 56th St., Omaha, Neb. — 8221 Atlantic Ave., P.O. Box 631, Bell, Cal.

to charge the battery for a minimum of 30 min. New batteries are treated similarly and given a comparative charge before going into service. One application is said to last for the life of the battery. For large batteries, one packet of the compound is used for each quart of cell volume.

The additive is claimed to prevent sulfation of the lead plates which eventually makes them hard and brittle, whereupon they no longer take a charge. AD-X2 is said to reclaim many useless batteries by reactivating dead cells.

A principal advantage of the product is its apparent ability to keep batteries "in charge" through long periods of idleness. Construction equipment that had stood idle for several months in desert heat was started up when needed with hardly any battery replacements.

Jess Ritchie says he stumbled upon the Battery AD-X2 formula somewhat accidentally during an eight-month period of testing some 1,600 chemical combinations.

Now he is battling with the U. S. Bureau of Standards because it condemns, in effect, all battery additives as "harmless, at best." Ritchie claims his product has not received a fair test, or the Bureau would be forced to exclude AD-X2 from that generalization.

Colorful Fittings Get Proper Grease

COLORED GREASE FITTINGS to assure the proper lubricant at the proper place solved a servicing problem on Caterpillar tractors, graders and attachments such as dozer blades, scrapers and logging arches, used by Morrison-Knudsen International Co. in a land-clearing operation in eastern Ceylon. For instance, red indicates light lubricants and blue heavy lubes. Matching containers and grease guns are painted similarly.

Land is being reclaimed for agricultural purposes and irrigation is planned in an area of some 250,000 acres. Native help is employed and L. (Tex) Taylor, project manager, has worked hard to get technical information into the minds of the eager employees. In demonstrating for those who became tractor operators, he soon discovered that they observed so closely that they were imitating errors too.

TWO TS 300 MOVE 247,000 YARDS in ten weeks!

MOTOR SCRAPERS

You can get production like this with LaPlant-Choate MOTOR SCRAPERS

HERE are a few of the reasons why you can be sure of big-production profits when LPC Motor Scrapers are on the job:

- Big capacity . . . 14-yds. struck and 18-yds. heaped . . . to haul bigger pay loads.
- Over 22 mph for speed on the haul road.
- Your choice of a 280 HP Buda or a 275 HP Cummins diesel for fast acceleration and extra power when you need it.
- Easy loading characteristics that cut valuable seconds off your cycle time.
- Big interchangeable tires for extra traction and flotation.
- Extra high apron lift and positive forced ejection for faster, smoother spreading.

Your LaPlant-Choate distributor can show you other Motor Scraper features that keep you ahead of schedule with lower over-all costs. See him before you bid on your next job.

That's the record of

CONCRETE MATERIALS & CONSTRUCTION COMPANY'S

two LaPlant-Choate Motor Scrapers on a stripping job near Cedar Rapids, Iowa.

The normal work week of the two TS 300s was 20 hours a day per unit, 6 days a week. Material moved consisted of sandy clay. Hauls started at 500 ft. and gradually lengthened to 1000 ft. as the job progressed. Grades varied, running as high as 30% at the start of the job.

No wonder Concrete Materials is sold on Motor Scraper performance. They originally bought two TS 300s in September of 1947, worked each unit 18,000 hours on the toughest kind of jobs, and were so well satisfied with the performance records they traded the original units for two new TS 300 Motor Scrapers.

Since February of 1951 when these new rigs went into service, they have worked a total of 6200 hours, with only 430 hours of downtime. *That's 93% efficient*, another reason why there are so many repeat orders for LaPlant-Choate Motor Scrapers.

LAPLANT-CHOATE

MANUFACTURING CO., INC. ® CEDAR RAPIDS, IOWA, U. S. A.

Cable-operated Scrapers in 6-, 9- and 14-yd. sizes for all makes of track-type tractors.

2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.

Hydraulic and Cable-operated Dozers.

CONSTRUCTION EQUIPMENT NEWS

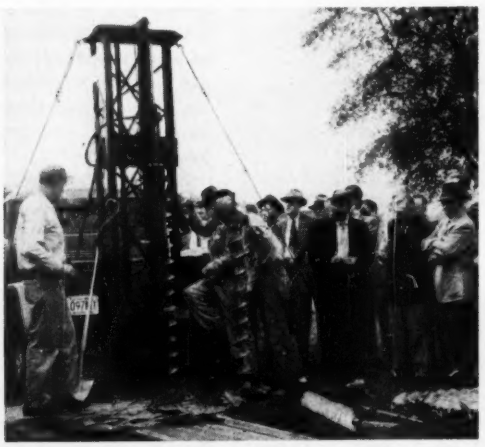
A Preview of New Machinery, Tools and Equipment That Will Help You on the Job

JAMES M. CONNOLLY, Equipment Editor

RIPPERS SCARIFY AS BULLDOZER BACKBLADES Here is a close-up of Preco back-rippers mounted on the rear of a bulldozer moldboard. They rip only when the tractor backs up, and are available for both straight and angling blade bulldozers. The four back-ripper housings are welded to the underside of the C-frame on angling blade rigs, permitting their use irrespective of the angle of the blade. The teeth float on the ground when the tractor moves forward, automatically digging and ripping when it reverses. Thus the dead-head, back-up time becomes a profitable operation and enables the blade to make a full load on each forward trip. If desired, they can be locked up out of the way.—**Preco Inc. 6300 E. Slauson Ave., Los Angeles 22, Calif.**

REMOTE HYDRAULIC CONTROL OF SCRAPER Among the unique features of this new McGee scraper is its cradle action and revolutionary hydraulic upper-link control. This permits for the first time hydraulic control of the scraping angle by the operator without dismounting. With a slight touch of the control valve he can change the tilt for scraping, backfilling or scarifying. With a bucket capacity of ¾ yd and a 5-ft, 6-in. backfilling blade, the entire weight of the scraper is only 450 lb. The manufacturer says it is fine for backfilling, scarifying, and both rough and finish grading. Satisfactory scraping jobs already handled include schoolyards, airports, streets, driveways etc.—**The Tractor Sales Corp., 1409 Santa Fe Ave., Los Angeles 21, Calif.**

SELF-LEVELING PLATFORMS ON ELECTRIC JUMBO Pictured here is one of two jumbos about to begin work in an underground iron mine in Missouri. Each of the jumbos has two hydraulic jib arms with self-leveling operators' platforms, independently driven tracks, a mast platform with adjustable height and electric drive motors. The mast can fold to allow the jumbo to enter a 15-ft entryway. Other models available include stationary masts, pivoted booms, jib arms mounted directly on the crawler chassis and with air or diesel-engine drive. All these models can be easily disassembled for entrance into mine shafts.—**Roger Iron Works Co., Joplin, Mo.**



SPEEDY TRUCK-MOUNTED ROTARY WELL DRILL Under a test for ECA, Public Health Service, Geological Survey and Defense Department officials, this truck-mounted, rotary well drill sank a 6-in. water well 61 ft deep in 40 min drilling time. In a total elapsed time of 2½ hr, the well was sunk, casing installed, pump connected and water flowing.

Originally designed as a means of obtaining core samples, the rig is being improved with USGS help to drill wells and at the same time take soil samples as part of a single operation.

It is mounted on the back of a four-wheel-drive, 1-ton

pickup truck—with power obtained from the drive shaft of the truck through a V-belt. Specially designed 5-ft sections of auger are used and are so designed that a truck engine can power the drill to a depth of 125 ft. Sections of durable plastic tubing—good for 50- to 60-psi pressures—form the well casing. These sections (produced by Carlon Products Corp.) are lighter and cheaper than steel casings. They are rigidly connected by chemically welding successive sections on the job with the help of a solvent. As each new section is coupled to the well casing, the solvent-coated male end is pushed firmly into a similarly coated female joint of the preceding section. The manufacturer claims that, after setting for 2 min, these joints will carry 8,000 ft of suspended casing.

Tests have shown that the rig will drill through any kind of uncemented sedimentary material, as well as thin layers of schist, soft sandstone and Florida limerock.

Mounted on the truck, the test rig stands 9 ft, 4 in. high and weighs 800 to 900 lb. The model shown in the picture is capable of drilling holes 3 to 10 in. in dia. The unit is being retailed through **Willys-Overland** dealers.

NEW EXCAVATOR HOE ATTACHMENT—A newly designed hoe attachment for the Koehring 304 excavator will increase the machine's digging depth to 19 ft 9 in., according to the manufacturer. Officially rated as a ¾-yd excavator, the 304's sturdy dipper arm is pivoted at the end of the boom and jackknifes to dig a vertical backwall. This reduces hand cleanup time to a minimum in basement digging. Another important advantage is the position of the countershaft in line with the boom foot mounting. Dipper drift is eliminated when the boom is raised and a versatile arangement provides top pro-

(Continued on page 124)

ON ASPHALT and GRANULAR SOILS
This NEW VIBRATORY COMPACTOR
IS A
Sensational PERFORMER!

In spite of its small size, the Jackson Vibratory Compactor delivers up to 4500 1¾-ton blows per minute. It propels itself and will firmly compact 900 to 1200 sq. ft. per hour — closely approaching theoretical density of the asphaltic mix being used, or 95% of maximum density in the case of granular soils compaction. It operates on 3-phase, 110V. 60 cycle AC from a *Jackson Power Plant mounted on a trailer which also has means for quickly picking up or lowering the Compactor. The ease and speed with which it may be moved from one location to another, together with the rapid, thorough job it does, makes it far superior to more cumbersome and more costly equipment on many types of operation. It is ideal for highway patching and widening, walks and drives, water-bound macadam bases, railway platforms and crossings; for compaction of sub-bases for concrete floors, in trenches, near abutments and many other places. Let us furnish you with complete details. It's a great time and money saver.

*Power Plant also generates single phase 110 V. 60 Cycle AC and may be used to operate other power tools and lights (Capacity: 2.5 KVA)

JACKSON VIBRATORS Inc.
LUDINGTON, MICHIGAN

HYSTER... One of the Oldest Names in Tractor Equipment*

33 Hyster Tractor Tools

...include a complete line of WINCHES, YARDERS, TRACTOR DONKEYS®, CRANES, the LOGGING SULKY® and ARCHES; GRID ROLLERS for bituminous road salvage; and HYSTAWAY®, the 5 in 1 tool that includes dragline, clamshell, crane, shovel and backhoe.

Hyster Tractor Tools make money for their owners in construction, logging, oil fields, road work, and in many branches of general industry and the government.

For 22 years Hyster has made tractor tools for use with Caterpillar track-type tractors. Mounted on the big yellow machines, dependable Hyster tractor tools are at work on the roughest, toughest jobs all over the world.

Hyster tractor tools are sold and serviced by more than 700 Caterpillar-Hyster dealer stores around the globe.

***MORE THAN 40,000 SATISFIED OWNERS OF HYSTER TRACTOR WINCHES**

The Grid Roller, Hyster's newest tractor tool, which is revolutionizing bituminous road salvage. Used with Caterpillar motor graders and Caterpillar DW10 and track-type tractors.
HYSTER

HYSTER COMPANY

2921 N. E. CLACKMAS, PORTLAND 8, OREGON
1821 NORTH ADAMS ST., PEORIA 1, ILLINOIS

MIXERMOBILE MANUFACTURERS

completely *Portable* CONCRETE

- WEIGH BATCHING
- MIXING
- ELEVATING

PLANT

CAPACITY UP TO 50 CU. YDS. PER HOUR

FROM RAW MATERIALS TO POURED CONCRETE

This ruggedly built trio means more jobs covered...reduced labor costs...savings in time and expense of making stationary installations. All functions are performed by one operator on each unit. Completely portable equipment travels at normal highway speeds...setup time for complete operation is 15 minutes or less.

MIXERMOBILE WEIGH BATCHER • Model WB-1

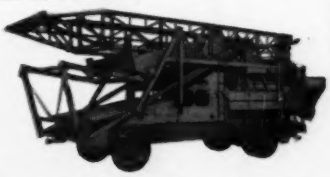
Completely portable unit weigh batches aggregate on the job. Can be charged with front end loader from storage piles or directly from dump trucks. Single operator sets up unit for operation in 15 minutes. Weigh batches up to 50 cu. yds. per hour.

- **Three 7 cu. yd. bins and 2 cu. yd. skip store up to 23 cu. yds. of aggregate.**
- **Charging skip hydraulically operated.**
- **Bin selector located by skip control directs skip.**
- **Equipped with either dial or beam scales.**
- **Weight, 17,800 lbs; height, 12 ft.; width, 8 ft.; overall length, 28 ft. (with skip down).**
- **Mounted all around on 8.25x20 tires.**

2-YD. MIXERMOBILE • Model M-7

Completely mobile concrete mixing and elevating plant eliminates cost of hauling and erecting expensive equipment. One man handles the entire operation from mixer to deck.

- **Improved batch-timer and counter insures positive mixing time.**
- **New electronic water meter gives unerring accuracy.**
- **Sturdy planetary drive hoist clutches give extra power, durability.**
- **Mixes up to 50 cu. yds. per hour.**



SCOOPMOBILE • Model C. The versatile Scoopmobile with exclusive planetary drive has 7 "quick change" attachments. Standard ¾-cu. yd. scoop bucket permits operator to keep Weigh Batcher unit performing to full capacity.

- **Loads and transports aggregate.**
- **Transports, elevates and pours concrete.**
- **Lifts and places form panels, timbers, etc., up to 4,000 lbs. capacity.**

ATTACHMENTS INCLUDE: Scoop buckets in various sizes, swivel and standard type concrete hoppers in ¾ cu. yd. capacities, lift forks, crane boom, track extensions with braces up to 26 feet overall.

Write for literature and address of your nearest dealer.

Mixermobile Manufacturers reserve the right to make improvements in design and specifications without notice.

MIXERMOBILE MANUFACTURERS

WAGNERMOBILE

Box 7527 • Portland 20, Oregon

DOUBLE the POWER

and you double the use

# of your FORD Tractor

WITH A

FUNK

CONVERSION KIT

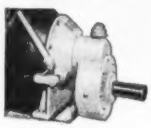
FUNK Products include:

Straight Power Take-Off Clutches

Right Angle Take-Offs

Front End Take-Offs

Gear Reduction Units and Heavy-Duty Clutches



You can do unbelievable jobs with ease when you equip your Ford Tractor with a regular 100 h.p. V-8 or 95 h.p. 6-cylinder Ford engine, on your old or new tractor, with our change-over kit. Increases operation time, and enables tractor to handle heavier equipment and accessories. Conversion costs about 1/3 as much as most tractors of same power. Install it yourself or have your dealer do it. Write TODAY for specifications and prices.

FUNK AIRCRAFT CO.

3303 AIRPORT DRIVE COFFEYVILLE, KANSAS

WELLMAN *Williams Type*

MORE YARDAGE PER DAY

● Elimination of excess materials and careful weight distribution permit rapid, rhythmic operation of Wellman Dragline Buckets. Operators can cover a wider digging radius with this streamlined bucket.

Built of special alloy steel, using strong welded design, Wellman buckets provide strength and stamina for long-term economy. Perforated designs also available. You'll do better with Wellman.

Want Facts?

Write for free descriptive bulletins.

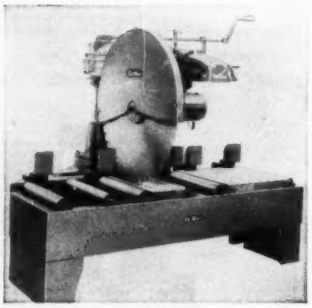
THE WELLMAN ENGINEERING COMPANY

7000 Central Avenue • Cleveland 4, Ohio

DRAGLINE, CLAMSHELL, CUSTOM-BUILT BUCKETS • STONE AND WOOD GRABS

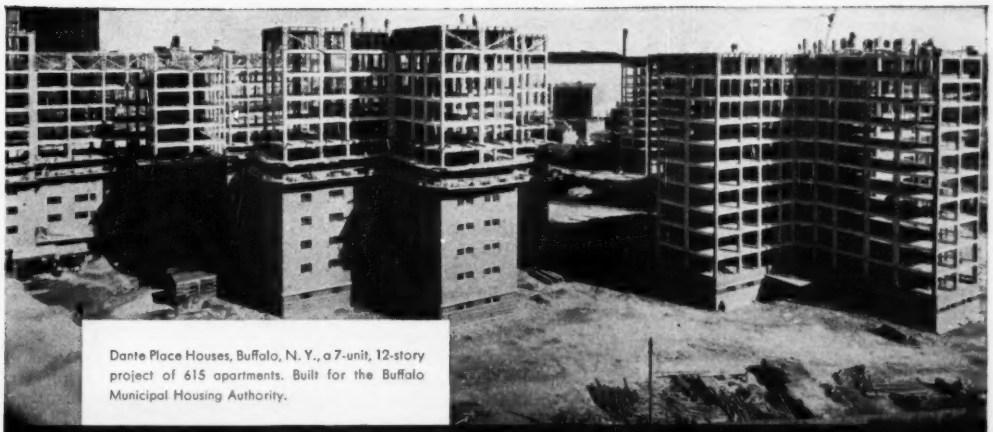
(Continued from page 121)

duction capacity. Adjusting links on the dipper arm allow for three variable settings so that the dipper angle can be matched to the type of material and cut being made. Double digging lines run out to the dipper, and eliminate reverse cable bends and sheaves which might clog with material and add to cable wear. The dipper can thus be pulled up tight to the boom for increased efficiency and less spill-over.—**The Koehring Co., Milwaukee 16, Wis.**



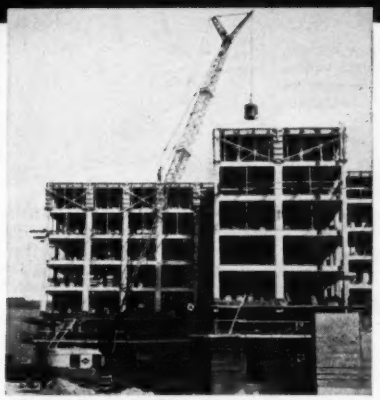
TIMBER CUTTER—A timber cutter that can cut 12x18 timbers in the cross-cut position and 12x12 timbers in the 45-deg miter position is now on the market. Powered by a 10-hp direct-drive motor, the cutter has features such as an unusually rugged arm and column, operating levers located within easy reach, and a segmental back guide that permits rapid changeover from cross-cutting to mitering. A 36-in. dia saw blade operates at 1,800 rpm and is the standard cutting blade used on this cutter. The roller conveyor table facilitates material handling. Material lies flat at all times and rolls along in one direction. — **De Walt, Inc., Lancaster, Pa.**

LINE-CLEARING TOOLS—Known as "Limb-Loppers" these air-powered insulated line-clearing tools meet the needs of contractors, utility and power companies whose crews run the risk of shock, injury or death while clearing power lines of limbs, foliage and other entanglements. The standard lopper is 6 ft 8 in. long, weighs 9 lb 8 oz and has a cutting capacity of 1¼ to 1¾ in. The heavy-duty model is 7 ft 2 in., weighs 11 lb 6 oz and can cut limbs up to 2½ in. in dia. Four-foot extender units can be added as desired. Single-piston and powerful double-piston models are available. They can be operated from any self-contained power source or power take-off compressor with capacities of 17-30 cfm and 125-150 psi.—**Miller-Robinson Co., 7007 Avalon Blvd., Los Angeles 3, Calif.**



Dante Place Houses, Buffalo, N. Y., a 7-unit, 12-story project of 615 apartments. Built for the Buffalo Municipal Housing Authority.

ON SCHEDULE with LEHIGH EARLY STRENGTH CEMENT



• Crawler Crane lifts 1¾ yard batches to work level.

Contractors: **THE JOHN W. COWPER COMPANY,** Buffalo, N.Y.
CORBETTA CONSTRUCTION CO., INC., New York City.

Architects: **BACKUS, CRANE & LOVE,** Buffalo, N.Y.

Careful planning, closely maintained schedules, fast job progress! It's the formula for on-time, low-overhead construction followed by the contractors on the Dante Place Houses shown here.

On this large apartment project, plans called for completion of the concrete frames in time to close in before winter. This meant a pouring schedule of a slab a day for 77 working days. By skillful management and the use of Lehigh Early Strength Cement the schedule was met. Bettered, in fact, for weather conditions held up work on 9 of the scheduled pouring days. The 77 slabs were poured in only 68 working days. What's more, operations were so well organized that the finishers were off the job promptly at 4:30 P.M. each day.

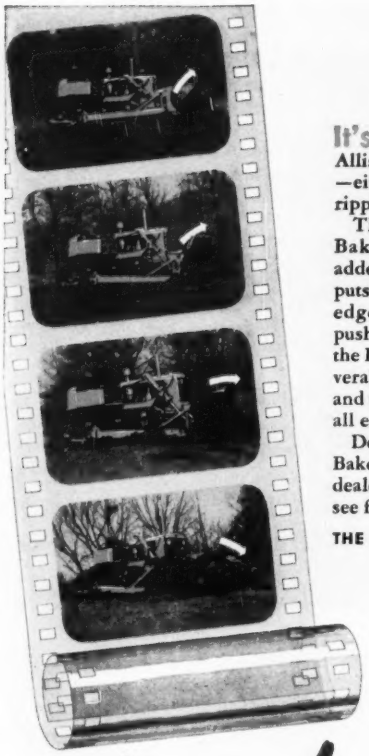
Whatever your cement requirements, there are Lehigh Cements to meet them. Our Service Department will be glad to help you with your specific problems.

LEHIGH PORTLAND CEMENT COMPANY
ALLENTOWN, PA. • CHICAGO, ILL. • SPOKANE, WASH.

Lehigh CEMENTS

• A complete floor slab, 175 yards, was poured daily. Column and beam forms were stripped in 24 hours, slab forms in 48.

LEHIGH PORTLAND CEMENT • LEHIGH EARLY STRENGTH CEMENT • LEHIGH AIR-ENTRAINING CEMENT • LEHIGH MORTAR CEMENT



It's easy dozing with Baker, Allis-Chalmers matched equipment—either for dozing, gradebuilding or ripping roots and rocks.

The "move-more-dirt" curve of Baker's famous involute blades, added to the design feature which puts the tractor weight on the cutting edge, leaves maximum power for push. These Baker features help make the Baker, A-C team the most maneuverable—the most easily operated, and thus by far the most *productive* of all earth moving equipment.

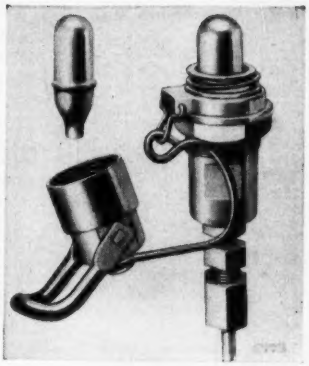
Don't settle for anything less than Baker, A-C! See your Baker, A-C dealer. Get on the bandwagon and see for yourself—

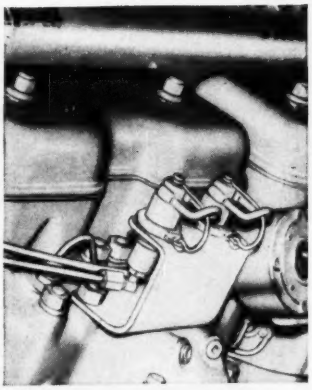
THE BAKER MANUFACTURING CO.
Springfield, Illinois

Wherever you see the Baker, A-C team at work, you see action like that pictured above, in photos of a conservation job near Lanark, Illinois. It's an Allis-Chalmers HD-9 with Baker Bulldozer.

Thar she rolls!

P. S. Have you seen the new 9-X *no push beam dozer*?





WINTER STARTING AIDS—Ether starting aids are not new, but they are becoming popular in areas that have periods of freezing and subzero temperatures. These ether groups, now offered for all Caterpillar diesel engines, are special attachments that give cold engines a substantial starting punch at the right moment. They are safe, easily mounted, require no servicing and are simple and inexpensive to operate. Storage of ether was hazardous until the introduction of steel container capsules. These are similar to carbon dioxide cartridges used in a variety of applications and are absolutely leakproof. They contain a percentage of gas which provides the required pressure for discharging the ether; the ignition point of ether is extremely low and, in burning, develops considerable heat. The heat of compression present in a diesel engine at usual cranking speeds and at air intake temperatures as low as zero degrees F usually is sufficient to ignite an ether-air mixture. Injected directly into the inlet manifold of the diesel, a small quantity of the mixture will cause the engine to start and develop enough heat to ignite the fuel injected into the cylinder. Ether starting groups are available for various

(Continued on page 128)

LOADS OVER 1,600,000 TONS . . .

8 Years Work in 3

From August 1948 to June 1951, this ¾-yard Lorain TL25 shovel has worked *continuously* for 16,000 grueling hours loading lead mill tailings . . . 24-hours-per-day . . . 7 days per-week. That's equal to almost 8 years of ordinary 40-hour-per-week service. Average output was 2400 to 3000 tons of material every 24-hours . . . somewhere between 1,600,000 and 2,000,000 total tons. This performance record explains why 2 more Lorain TL-25's have joined this "young veteran" which is still in service! With a Lorain "TL" on the job, you, too, can get record-breaking performance!

LORAINS NO. 2 & 3 were purchased by this owner based on the steady 24-hour performance record of their first Lorain TL-25.

REASONS FOR RECORD-BREAKING "TL-25" PERFORMANCE

Check amazing Lorain "TL-25" performance with your Thew-Lorain Distributor . . . ask about these exclusive design advantages . . . √ "Packaged" Components — engine, clutch shaft, etc. — may be removed and replaced as complete units √ 5 identical, interchangeable clutches √ One-piece, all-welded turntable bed √ Anti-friction bearings √ Complete package design — no extras to buy √ 3 sizes of 2 speed crawlers √ 4 rubber-tire mountings √ 5 interchangeable front ends √ Get *all* the facts on the Lorain TL 25 from your nearby Thew-Lorain Distributor.

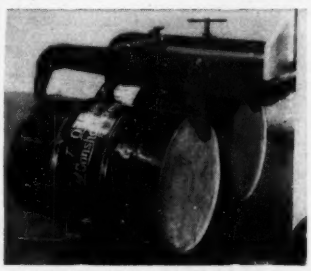
THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN

(Continued from page 126)
model engines to replace the manifold air heater groups formerly used on them. The connecting tube from the applicator leads directly into a plate covering the inlet manifold opening formerly used for the manifold air heater. 9F39 capsules which are used with all groups cost only 25c.—**Caterpillar Tractor Co., Peoria, Ill.**

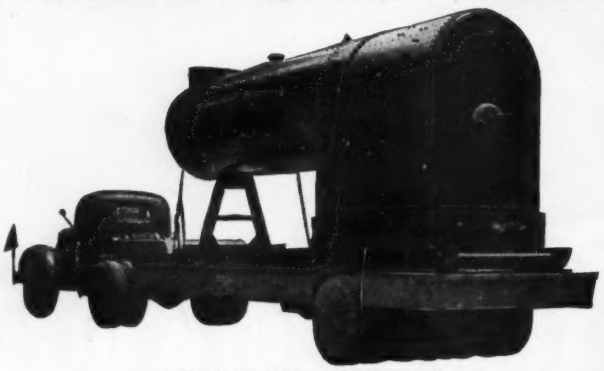
PUMP FOR PLASTICS—New unit for handling plastic materials and thick slurries has been designed by a Scotchman. The present machine handles approximately 5 tons of material per hr, but current development work aims at doubling that capacity by utilizing a 150-gal centrifugal pump in place of the 50-gal unit which supplies the hydraulic power. The Meader pump can be operated by steam, hydraulic power or compressed air. It consists of a chute or hopper, a cutting cylinder, which alternately is withdrawn and inserted into the base of a hopper, and a ram assembly in which the smaller ram expels the material from the cutting cylinder and forces it into a discharge pipe. A hydraulic cylinder at one side of the hopper bottom permits passage of pressure water and exhaust water. The sequence of movement is: Withdrawal of cutting cylinder and ram assembly from base of hopper; cutting cylinder forced into the material, smaller ram forced through cutting cylinder, expelling material through discharge valve and into discharge pipe. There are no external glands; material being handled is contained completely within the pump and its discharge pipe. Successful tests are claimed on runs with various materials from liquid state to that of a stiff plastic, including mud, residue from processes, sewage, cement slurries, un-set concrete, paste, and ceramic compositions.—**Henry Balfour & Co., Ltd., Leven, Fife, Scotland.**

STANDARDIZATION OF FUEL PUMPS—Testing of fuel pumps used on Cummins fuel systems has been standardized by the development of a new fuel pump test stand. Two models, the single-disk and the new DD (double-disk) are offered. Cummins' single-plunger, low-pressure, distributor-type fuel pumps measure the fuel charge for all cylinders and assure that each injector receives the proper predetermined amount of fuel at any required engine speed and load within the approved ratings.—**Cummins Engine Co., Inc., Columbus, Ind.**



DRUM-HANDLING DEVICE — A horizontal drum-handling fixture is available and can be attached to any industrial fork truck without removing the fork or making hydraulic or mechanical connections. Completely automatic, the device is a self-contained unit that fits over the forks and is fixed to them with two screw-type clamps. One or two standard drums can be picked up, as shown above, simply by lowering the handler over them while the truck slowly backs away. The rear clamps are spring-loaded and snap under the lip of the drum. When the drums are lifted, gravity action locks the clamping hooks in place. There is no load on the springs at any time. Depositing the drums is equally simple. They are lowered to the floor and the truck moved forward to stretch the springs on the rear clamps. As soon as the forward clamps are free, the truck channels are tilted back. The truck then is backed away to free the rear clamps. Loads cannot come loose while they are aloft.—**The Yale & Towne Manufacturing Co., Philadelphia Div., 11000 Roosevelt Blvd., Philadelphia 15, Pa.**

NEED STEAM?



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4. Oversize seamless firebox.
5. Butt straps calked and seal welded inside
6. Four-inch water space around firebox.
7. Boilers available from 40 to 150 H.P. Working Pressures from 125 to 350 lbs.

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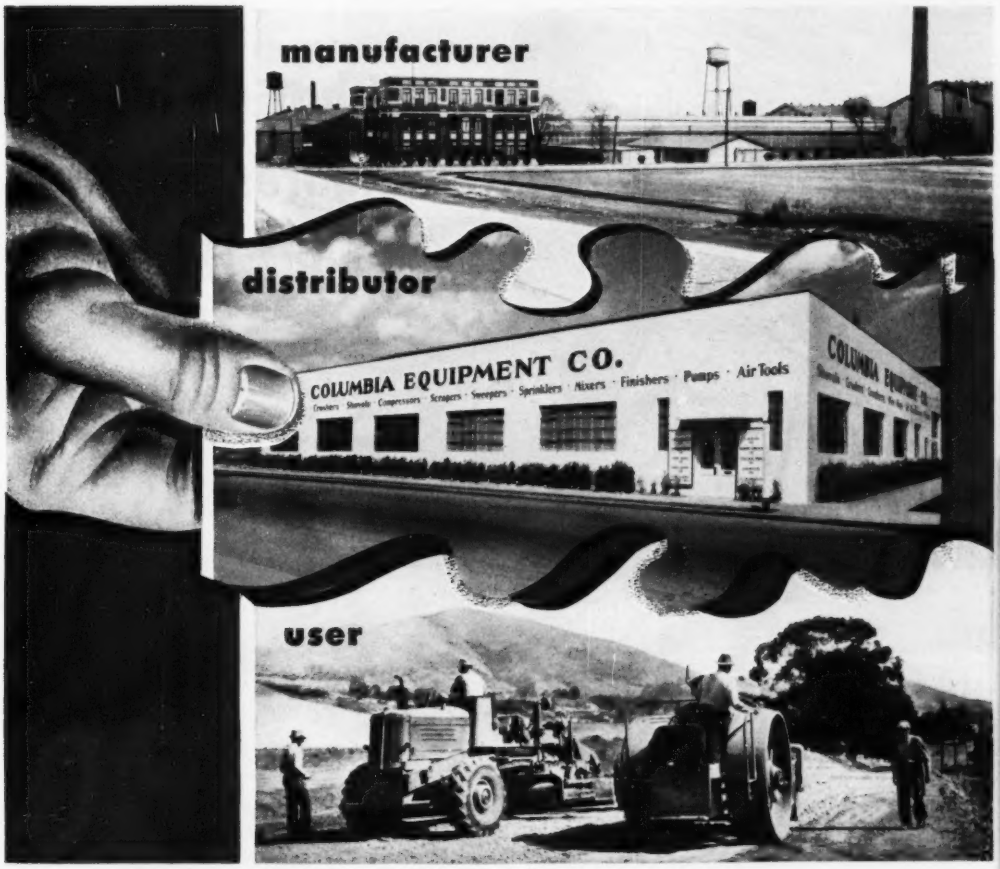
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PORTABLE RIVETER — Riveting with the new Guillotine Riveteer is done by a squeezing action rather

What do his figures tell him about this rope ?

Since the day it was installed, he's kept a brief record of this wire rope's performance. The black book tells him the date it went to work, the type of work it's doing, and roughly just how much it does each day. When the rope is retired from service, he'll be able to say whether it's done a good job for him—given him his money's worth.

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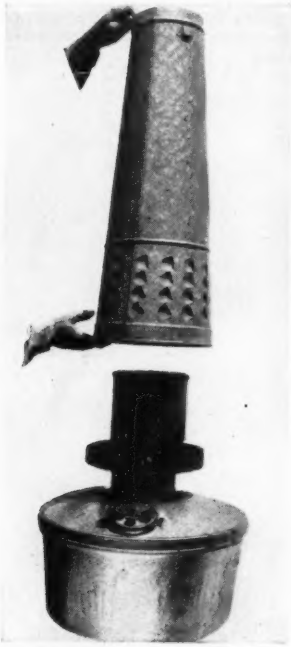
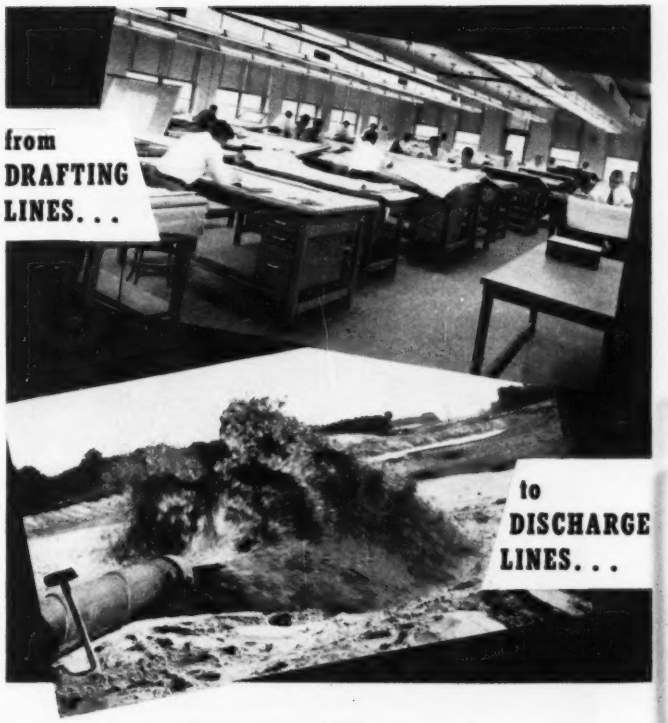
IMPROVED STEAM-DETERGENT CLEANING — Steam-jet cleaning has been found to be effective at pressures from 125 to 145 psi, but according to this manufacturer's

PORTABLE RIVETER — Riveting with the new Guillotine Riveteer is done by a squeezing action rather than the customary pounding on the rivet head. The unit delivers 60,000-lb thrust through its hydraulic ram, and can drive ⅝-in. cold rivets. It's portable, and according to the manufacturer the entire riveting cycle takes only 2 or 3 sec. The operator merely presses a hand valve to actuate the ram, and when he releases it, retraction is automatic. Full thrust is delivered over the entire stroke and no adjustment is needed between different length rivets as with air-operated equipment. Modifications are also available for cutting steel bars, wire rope and cable.—**Manco Manufacturing Co., Bradley, Ill.**



DISTILLING SALAMANDER—Unit shown above looks similar to other oil-burning salamanders, but it operates quite differently. It has a flame spreader inside the stack and the stack has horizontal louvers. This causes it to burn in a rapid upward spinning spiral around the flame spreader. It is designed so that this action results in far greater heat at the base of the stack—giving increased sideward radiation, and also greatly reduces the escape velocity of gases going out the top. A distilling type, it has no wicks, jets, or valves. One filling should burn from 10 to 20 hr. Designed for use as temporary heat inside or out of doors. Heat output is reported at 100,000 Btu's per hr on ¾ gal of fuel oil.—**California Heater Co., Pomona, Calif.**



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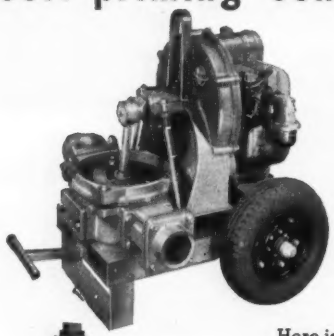
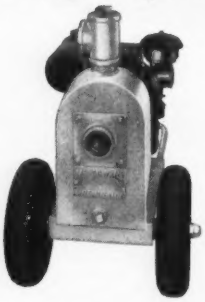
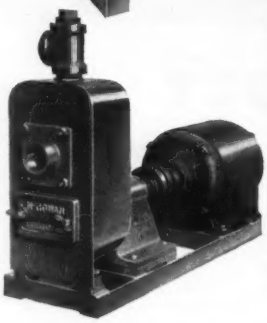
self-priming centrifugal pumps







Here is the outstanding line of self-priming Centrifugal pumps in the field . . . fast sellers for an aggressive Distributor to handle. These pumps are now in operation all over the world. They are of all welded steel construction, with automatic priming, non-clogging impeller, hardened wear plates, large access plates, tested trouble free shaft seals. Sizes up to 125 M. In 3", 4", 6", 8", 10" high pressure, 3", 4" diaphragm. Built by a Company with an international reputation for quality and service since 1852.

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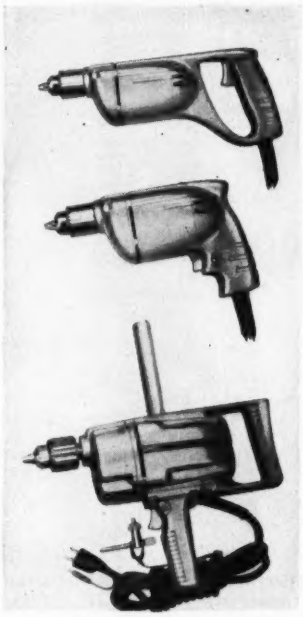
IMPROVED STEAM-DETERGENT CLEANING — Steam-jet cleaning has been found to be effective at pressures from 125 to 145 psi, but according to this manufacturer's field and laboratory tests, faster cleaning can be obtained by stepping up jet velocity without adding appreciably to the electric power requirements. The new SPEEDYJET Steam Jet Cleaner, Model JC-25, and the equally new twin-jet Steam Lance combine to give super-jet velocity and extra powerful cleaning action. Mounting a water tank big enough to provide 3 to 4 hr of continuous operation, the 16x48-in. unit is readily portable. Current shuts off automatically when water is all boiled off. Available for 220, 440 or 550 v, it's rated at 20 kw and consumes only 15 kw per hr under ordinary operating conditions.—**Livingstone Engineering Co., Worcester, Mass.**



HAND ELECTRIC DRILLS—These drills are built in different power and speed models to cover the speed and torque requirements of ¼-, ⅜- and ½-in. capacity portable electric drills. One of the prime features is forced ventilation for cool operation in continuous use. All the ¼-in. models and the extra heavy duty models in the ⅜- and ½-in. capacities have ball and needle bearings throughout. Purchasers may have a choice of eight speeds from 500 to 5,000 rpm without a load. There is also a choice of either pistol-grip or saw-type handle to suit operator preference. Available from—**Portable Electric Tools, Inc., 320 W. 83rd St., Chicago 20, Ill.**

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FOUR-UNIT ON DAM

SIX-UNIT ON HIGHWAY

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SET NEW RECORDS for compacting heavier lifts with fewer passes. On the big jobs where maximum compaction is required the Southwest gets the work done quickly and efficiently.

Weight-box units of Southwest Compaction Rollers oscillate up and down independently and provide a constant, uniform compacting load on each tire regardless of ground contours. There is no bridging, no shifting of load from tire to tire.

Sectionalized tubular yoke allows the use of any combination from 3 to 6 weight-box units. Sizes and capacities range from 10 to 100 tons, suitable for light, medium or heavy duty compacting of earth.

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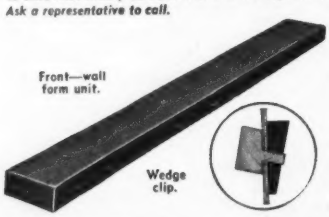

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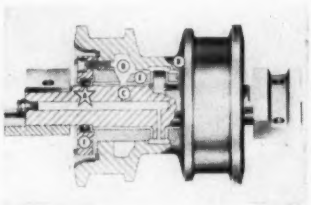
FLOODLIGHT PROJECTOR — The Tilley floodlight projector burns ordinary kerosene and gives a light of 5,000 mean reflected cp. It is a self-contained unit with no cables or any other obstruction. User is entirely independent of batteries, generators or the like. Said to be unaffected by weather, it is recommended for use in all emergencies. Its capacity is 6 pt of fuel, sufficient for about 40 burning hours. Over-all dimensions are 14½x11½x26 in.—**Wm. W. Lee and Son, 20 E. Jackson Blvd., Chicago 4, Ill.**



INTERCHANGEABLE TRACK ROLLERS—"Flow-Away" sealing is the secret of a new interchangeable track roller which permits a small amount of grease to pass outward through the seals, and at the same time excludes all dirt, grit or abrasive matter from the roller. The use of mounting blocks instead of conventional end collars provides sufficient clearance space between the blocks and the seal housing to allow grease to flow outward. The Carroll one-piece roller shell is made in a uniform-section manganese alloy steel casting, heat-treated to insure the right degree of hardness for long performance-life. An important feature is that the roller shell, shaft and bearings are exactly the same dimensions as others now on the market. Outstanding features shown in the photo above include (A) dirt-exclusion seal, (B) one-piece shell, (C) center-thrust-type shaft, (D) grease reservoirs (five times capacity of conventional rollers) (E) bronze bushings, and (F) seal housing. — **Craig Carroll Co., Portland, Ore.**

SPACE HEATER — The initial Model Master space heater has 200,000 Btu output per hr and is known as the Master Hot-R-Nell space heater. Said to require no warm-up period, the hot air output is about 10,000 and 12,000 cfm and the air is directed downward toward the floor by special louvers. The space heater burns kerosene or No. 1 or No. 2 fuel oil at the rate of about 1½ gph. Is recommended for general heating; thawing of material, equipment or working areas; also for space or hot water heating and for drying construction work. Mounted on rubber-tired wheels for quick portability and provided with automatic shutoff.—**The Master Vibrator Co., Dayton, Ohio.**

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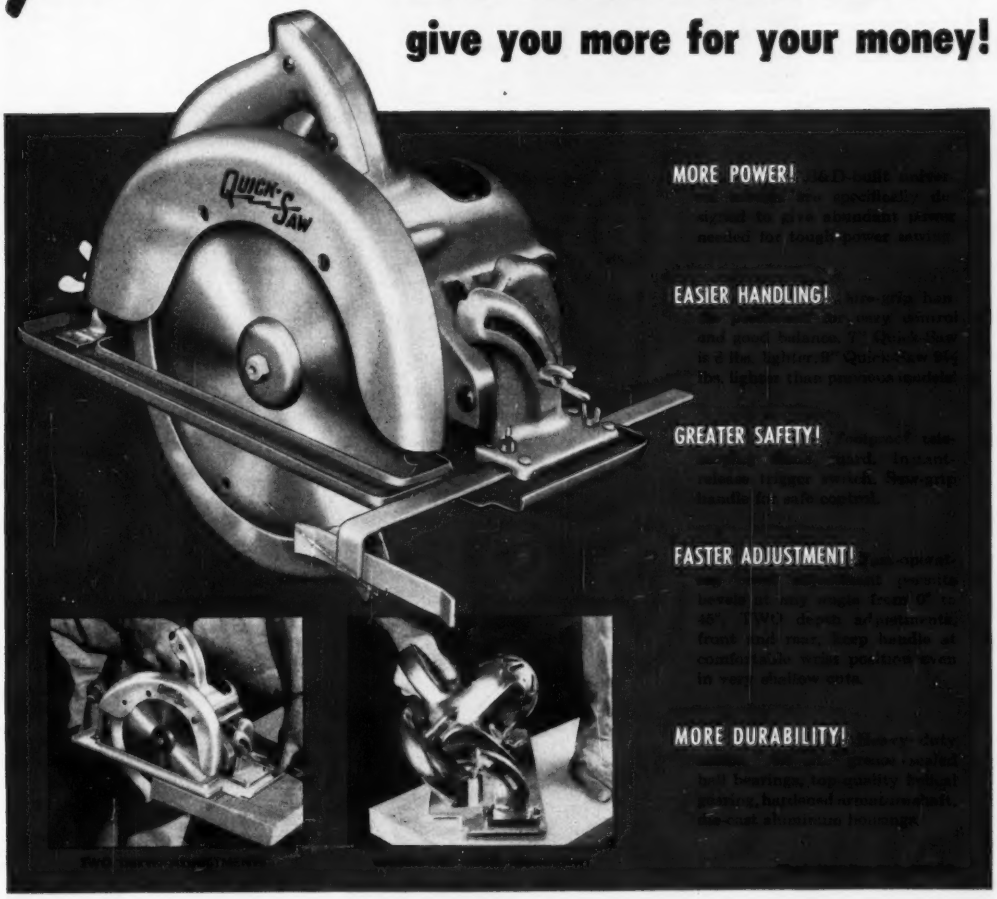

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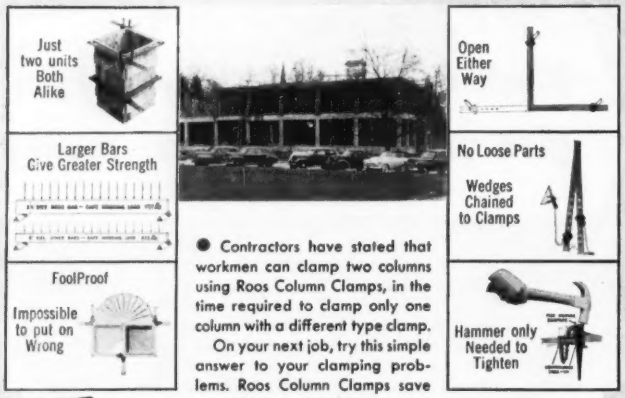

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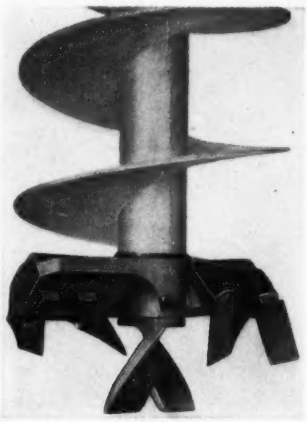
FOOLPROOF SINGLE-LEVER CONTROL—Many mixers on the market have single-lever control. On one type you move it in one direction to engage a clutch, then through a dead central position to the other side for brake contact. On others you move on past the clutch position to engage the brake at the extreme end of travel. In all cases there must be a very fine adjustment between the brake and clutch to prevent slipping of a loaded skip, snapping of cables, etc. On this new Rex 6S mixer *the brake is always engaged*, and the lever can be moved only in one direction—to engage the clutch. Should the operator's hand slip, the lever returns automatically to brake position. The raising skip, when it strikes a stop, automatically knocks out the clutch, returning the lever to brake position also. At no time does it pass through a dead, neutral spot.—**Chain Belt Company of Milwaukee, 1600 W. Bruce St., Milwaukee 4, Wis.**



CUTTING HEAD FOR HELIX TYPE EARTH DRILL — Any continuous helix type earth drill or post hole auger can now be fitted with a new Pengo cutting head. It replaces the conventional cutting head by means of direct welding to the bottom of any continuous helix auger. Makes it possible to bore holes under adverse conditions with machines using the continual helix auger, where formerly only heavy-type machines were capable of boring. The cutting teeth are arranged in the same staggered pattern as provided on the manufacturer's regular heavy-duty twin helix earth auger used widely by power and telephone companies. All parts are standard and interchangeable with the standard earth auger of same size, including shank plates, replaceable points, and the fishtail pilot bits. Available in eight sizes ranging from 10- to 24-in. dia from —**Petersen Engineering Co., Santa Clara, Calif.**

Laying one of the three courses of hot-mix Texaco Asphaltic Concrete, constructed on 35 miles of Indiana Route 46 near Greensburg by the Breslin Construction Company of Louisville, Ky.

A 35-mile resurfacing project on Indiana's Route 46

For resurfacing various sections of the Indiana State Highway System during 1951, two types of Texaco asphalt paving mixes were used. One of the principal differences between the two mixes lay in the asphalt product employed as binder. Both Texaco RC-5 Cutback Asphalt and a 60-70 penetration Texaco Asphalt Cement were used for the purpose on Indiana highways last year.

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Asphalt plant of the Breslin Construction Company, which turned out approximately 70,000 tons of asphalt mix for this project.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

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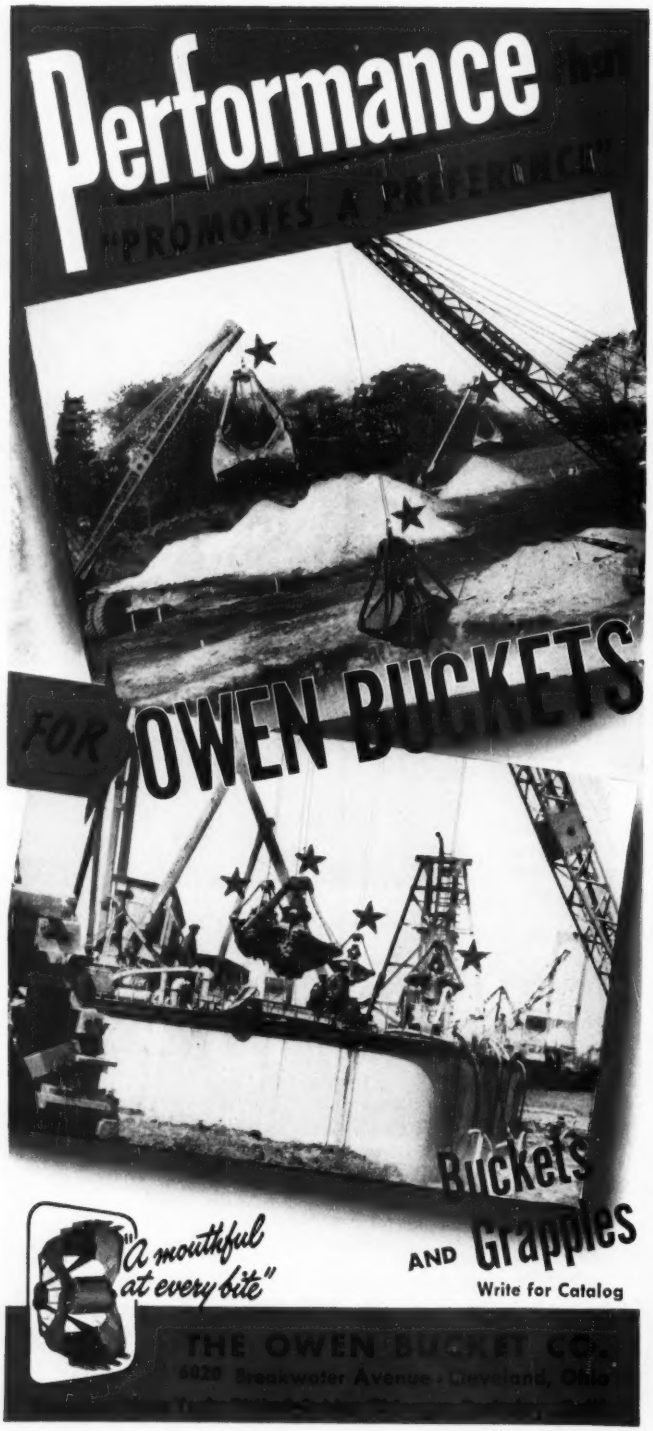
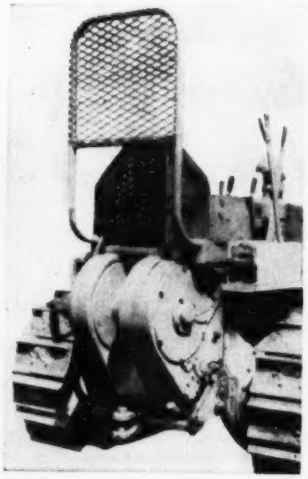
TEXACO

TEXACO ASPHALT

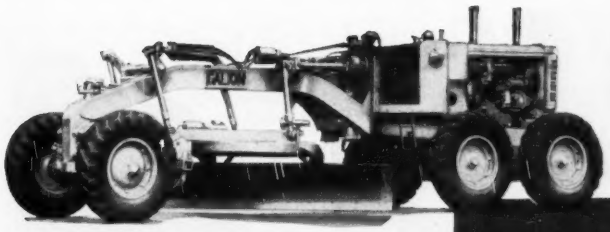




HIGH-SPEED WINCH — Here is a lightweight, free-spooling tractor winch with fast line speeds and quick positive brake action—a completely new D4 HySpeed winch. It can be mounted on either seat or fender-tank type Caterpillar D4 tractors. Some of the jobs recommended for this winch and line are lifting, pulling, crane work, light piledriving, ground skidding of logs, and feeder cat work in logging. **— Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore.**

LIGHTWEIGHT POCKET BOLT AND NUT GAGE—If you have ever had a box full of assorted nuts and bolts and have struggled long and hard to sort them into proper bins, you will be happy to hear of the new pocket-style bolt and nut gage recently put on the market. Made of hard, wear-resisting Polystyrene plastic in bright colors, the new tool will gage bolts and screws from No. 8 through ¾-in. dia; nuts from No. 8 through ⅝-in. dia. Bolts are gaged quickly by pushing them through "size" holes, and nuts by dropping them over the plugs on top edge of the gage. The plug gage tells not only the diameter of the nut, but also whether it is Coarse Thread (U.S.S.) or Fine Thread (S.A.E.) Measuring only 7¼ in. over-all, the gage is accurate to .005-in. tolerance. **—Sorrell & Sons Co., 295 Argyle Rd., Rocky River 16, Ohio.**

Keep the
SCRAP
Coming Back



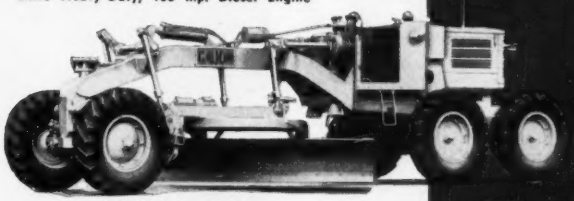
No. 118 MOTOR GRADER
Extra Heavy-Duty, 100 h.p. Diesel Engine

GALION GRADERS

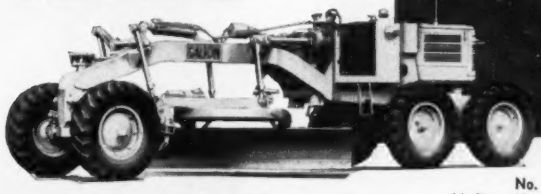
STANDARD EQUIPMENT

includes
Same size tires.....
on front and rear.
Manual steering with
hydraulic booster.

* on Nos. 118, 104, and 203



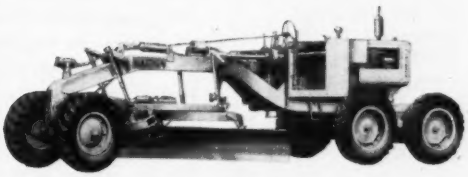
No. 104 MOTOR GRADER
Heavy-Duty, 76 h.p. Diesel Engine



No. 203 MOTOR GRADER
Medium Heavy-Duty, 70 h.p. Diesel Engine

COMPARE BEFORE YOU BUY !

Every feature necessary for top performance is included as STANDARD EQUIPMENT on Galion Nos. 118, 104, and 203 Motor Graders. When you compare prices--also compare standard equipment--and you will see why GALION gives you more for your money.



No. 303 MOTOR GRADER
Medium-Duty, 50 h.p. Diesel Engine, Hydraulic Booster Steering and Large Front Tires are availale as extra equipment.

A size for every need and use. Write for information on the size in which you are interested.

GALION

ESTABLISHED 1907 **MOTOR GRADERS • ROLLERS**

THE GALION IRON WORKS & MFG. CO., General and Export Offices — Galion, Ohio, U. S. A.
Cable address: GALIONIRON, Galion, Ohio

CONTINENTAL RED SEALS . . .

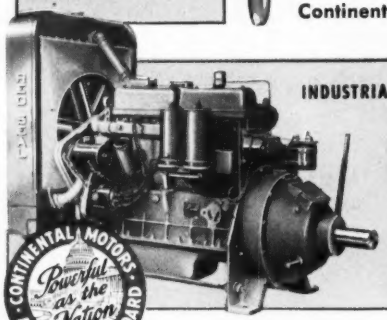
Squeeze

ALL THE POWER

FROM ANY FUEL

THERE'S A CONTINENTAL RED SEAL MODEL ENGINEERED TO THE EXACT NEEDS OF VIRTUALLY EVERY INDUSTRIAL, CONSTRUCTION, TRANSPORTATION AND FARM JOB.

Fuel economy takes on new importance in these days of rising costs—and Continental Motors' 50 years of aggressive engineering has produced an expert matching of the factors on which economy depends. The more equipment you operate, the more you'll save by standardizing on makes that feature famous Continental Red Seal power.



INDUSTRIAL MODEL R-600 . . .

Open Power Unit. Six cylinder, overhead valve design. 65 to 110 shaft horsepower for continuous duty—75 to 140 shaft horsepower for intermittent duty. This Continental Red Seal model also available as closed power unit with sturdy sheet metal house with detachable sides.

FACTORY-AUTHORIZED SERVICE AND GENUINE CONTINENTAL RED SEAL PARTS AVAILABLE FROM COAST TO COAST

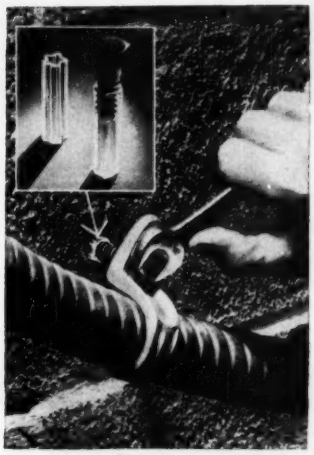
Continental Motors Corporation

MUSKEGON, MICHIGAN

GRANITE PLUG DRILL BIT—Up in Barre, Vt. recently, at the Rock of Ages quarry an interesting experiment took place which resulted in speed recordings of 13 sec. per hole, on the average, for wet drilling of ¼-in. holes, 3½ in. deep. Tests were made in different locations with regular quarry teams and L 27 Joy Manufacturing Co. Self-Rotating pneumatic hammer. In early stages drilling was done dry, but dust conditions hastened a change to water, at which time a hole was drilled longitudinally through the bit itself. Since the tip is carbide, care must be exercised to turn on the water before drilling. Wetting it after heating would crack it. The self-rotating hammer precluded the need for manual twisting and helped establish the speed. The company provides clear easy-to-understand instruction sheets on use and regrinding of the THUNDERBOLT Carbide-tipped Granite Plug Drill Bit, as well as grinding templets—**New England Carbide Tool Co., Inc., 60 Brookline St., Cambridge 39, Mass.**

DEGREASING COMPOUND—This is an answer to a longstanding need for a versatile compound that can be used for everything from degreasing heavily coated parts to washing motors and painted trucks, according to its maker. Fleet maintenance establishments and garages stand to

benefit substantially by its use. It must be diluted with from 3 to 8 parts of kerosene or light fuel oil for most applications. Its high grease solvent properties, instant rinsability, make it fast acting and easy to use. Just spray or swab on in desired concentration, allow it to stand for 15 min, then hose it off. It is self-drying. A hydraulic, hand-pumped spray gun or a specially designed air gun is given free with each initial order of a 55-gal drum. These guns facilitate the use of the Greasmaster. When diluted 8 to 1 with kerosene, the price of the resulting cleaning mixture can be as low as 2¼c a gal.—**Stewart-Hall Chemical Corp., Dept. TSN, Mount Vernon, N. Y.**



PLASTIC SCREW ANCHORS — Here is a different screw anchor made of extruded Tenite plastic which the manufacturer says can be used to secure nails or screws in practically any solid material, such as brick, plaster, or cinder block. The anchor is driven into a drilled hole in the usual fashion and then the screw or nail inserted. The difference in the plastic is that it cold-flows into crevices of the hole to make a firmer grip. Manufactured over-size, Scru-Tite anchors give positive two-way grip and have excellent holding power. They are available in all screw sizes; provide safe anchoring; are corrosion-proof; and are high in impact strength.—**Mastercraft Plastics Co., Inc., 95-32 150th St., Jamaica 4, N. Y.**

LIGHT SPUR-GEAR HOIST—Now in production in ½- and 1-ton capacities, this new spur-gear hoist, including standard length of high strength coil chain for an 8-ft lift, weighs only 39½ lb. The back plate is laminated to give extra rigidity for supporting the hoist mechanism. This plate and other load-holding

(Continued on page 143)

FOR FAST, ECONOMICAL HIGHWAY TEST CORES

The New Acker KR Shot Core Drill!

The Acker KR mounts on truck, trailer or drag. Power can be gasoline, kerosene, diesel, electric or air motor.

The new Acker KR SHOT CORE DRILL is especially designed for obtaining clean, unbroken highway test cores quickly, inexpensively—accurately.

For economy, inexpensive steel shot does the cutting, reducing bit servicing and operational expenses.

Improved Acker design assures clean-cut core recovery up to 20" in diameter even from steel reinforced concrete.

Get the facts today—ask for Bulletin 19.

CM&E.

ACKER DRILL CO., INC.

SCRANTON 3, PA.

Manufacturers of diamond and shot core drills and supplies.

... the new separable

FLEXCO HINGED

BELT FASTENERS

U. S. Patent No. 2,477,855

- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts ⅜" to ½" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4699 Lexington St., Chicago 44, Ill.

CHEAPER STONE SPREADING!

Two of S. J. Groves Adnun Pavers spreading stone on the New Jersey Turnpike

ADNUNS are cutting the cost of stone spreading! In comparison with the tail gate and blade method, Adnuns are spreading twice as much stone in a given period of time. They are saving stone because of more accurate spreading with a minimum of spotting. They reduce the crew by half and free the grader for other work.

The Adnun gives you positive traction on all wheels whether turning or going straight ahead. There is no loss of power in handling the truck on curves as there is with clutching and declutching in steering crawlers.

Compare the Adnun with lighter, cheaper units. The Adnun is heavily built and capable of handling the heavy loads of the courser grade stone without fear of constant breakdown. The Rubber Tired Stone Spreading Attachment gives full traction and saves your rollers for black top. The Overlapping Cutter Bar carries the aggregate up to, and compacts it with the parallel course, and the Power Cut-Off permits carrying hopper loads across intersections without tag-end run outs. The Adnun has been proved on all classes of material spreading and is the only Black Top Paver unreservedly recommended for spreading both aggregates and black top. Don't buy a one-purpose or substandard machine.

The Indianapolis Speedway. Here is pavement that takes the fastest traffic known—Adnun laid 15 years ago. This is only one example of the many miles of pavement laid up to 17 years ago and still in service. Ask for the booklet, Roads That Last!

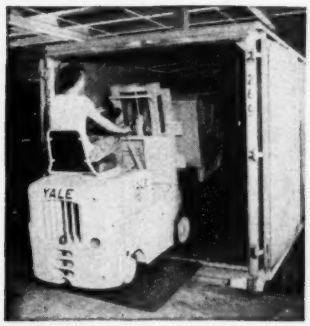
THE FOOTE COMPANY, INC.
Subsidiary of Blaw-Knox Co.
1910 State St. Nunda, New York

ADNUN
TRADE MARK REGISTERED

BLACK TOP PAVER

(Continued from page 141)

parts are of high-strength steel that will hold five times the rated capacity of the hoist, according to the manufacturer. To check further and confirm its strength, every Challenger hoist is tested at 100% overload as it comes off the production line. According to the manufacturer, a survey conducted among users of hoists revealed that the most universally expressed unfulfilled need was for easier servicing. This unit therefore is built so that it may be disassembled in a matter of minutes with simple tools. The unit is sealed and always runs in a lubricant. — **Coffing Hoist Co., 800 Walter St., Danville, Ill.**



VERSATILE FORK TRUCK—As the picture above shows, the new series of gasoline-powered fork trucks has been specifically designed for work in and around freight cars and big interstate trucks. Available in capacities up to 2,000 lb, the "Trucker" is only 68 in. high with the lift collapsed. In duplex models the truck can elevate its fork 54 in. before secondary channels come into play to increase the height. This allows double stacking inside trucks and freight cars. Clutch, gas, brake, gearshift, are all of the automotive type while fork-hoisting, lowering and tilting controls are located near the steering wheel. The full-floating drive axle with involute spline drive shafts is completely inclosed in an oil-tight housing.—**The Yale & Towne Manufacturing Co., 11,000 Roosevelt Blvd., Philadelphia 15, Pa.**

SASHLESS WINDOW—Here is a window that consists of a redwood frame and no hardware, except an ingenious pull-latch which locks the window closed or partly open. The "Pierson 20-20 Window" comes in seven fabricated redwood pieces, ready to nail together into wall frames. It eliminates sashes, putty and weights; comes in one size, 4x3 ft. Two panes of glass are used, one of them sliding. Glass is not included with the fabricated window, however.—**Ernest Pierson Co., Eureka, Calif.**

WORKS BOTH ENDS

ON BIG STEEL MILL PROJECT...

Get it done . . . and fast! That's the "word" at the site of U. S. Steel Company's new Fairless Works. And that's the reason James Armour Excavating Company is using two MICHIGAN Truck Cranes to handle and distribute materials at this huge steel mill project.

Here's just one example cited by operator Randall Auer: One of the MICHIGANS transferred pipe from a freight car to a truck, then followed the truck to a spot half-a-mile away where it unloaded the pipe. It then accompanied the empty truck back to the car for another load. The process was repeated until all the pipe had been removed from the car. Only MICHIGAN'S *speed and mobility* made it possible to work both ends of this job with one crane.

When you need an excavator-crane that has everything you want *plus* speed and mobility, investigate MICHIGAN . . . most complete line of ⅜-yard and ½-yard excavator-cranes available. Write for full details.

MICHIGAN POWER SHOVEL COMPANY

495 Second Street, Benton Harbor, Michigan, U.S.A.

STURDILITE

The HEAVY-DUTY FLOOD LAMP THAT

Lights Your Work Better . . . Gives Longer Service at Lower Cost

Vibration-absorbing Base

Specially Designed for Efficient Service on
Shovels — Excavators — Drag-lines
Roadbuilding Equipment
Locomotive Cranes — Tractors

"BUILT to take it," say users of STURDILITE Heavy-Duty Flood Lamps, after years of trouble-free service. Hermetically sealed-beam lamp—no reflector to become tarnished. Complete assembly mounted on rubber cushioned base that absorbs vibration and shocks. Available in 6-8, 12-16, 24-28 and 110-120 voltages.

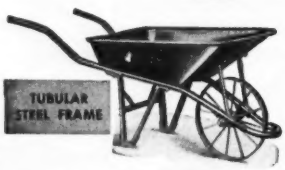
COMPLETE BULLETIN, specifications, and quantity prices sent promptly upon request.

Metal Spinning Division

PHOENIX PRODUCTS COMPANY

4729 N. 27TH STREET, MILWAUKEE 16, WISCONSIN

Am I Glad We Have STERLINGS!



At a time when wheelbarrows are scarce, it certainly feels good to have a supply of sturdy Sterling Barrows on hand. Sterlings are so ruggedly constructed, they seem to last forever. In the present emergency, many Sterlings are working overtime, taking hard punishment and coming back for more . . . again proving . . . IT PAYS TO BUY THE BEST.

(Above) Model D3½S Maximum Capacity 3½ cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs. V-shaped front braces and brace support.

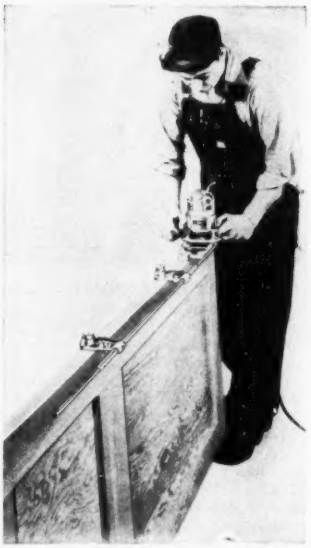
(Right) Model C5W Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

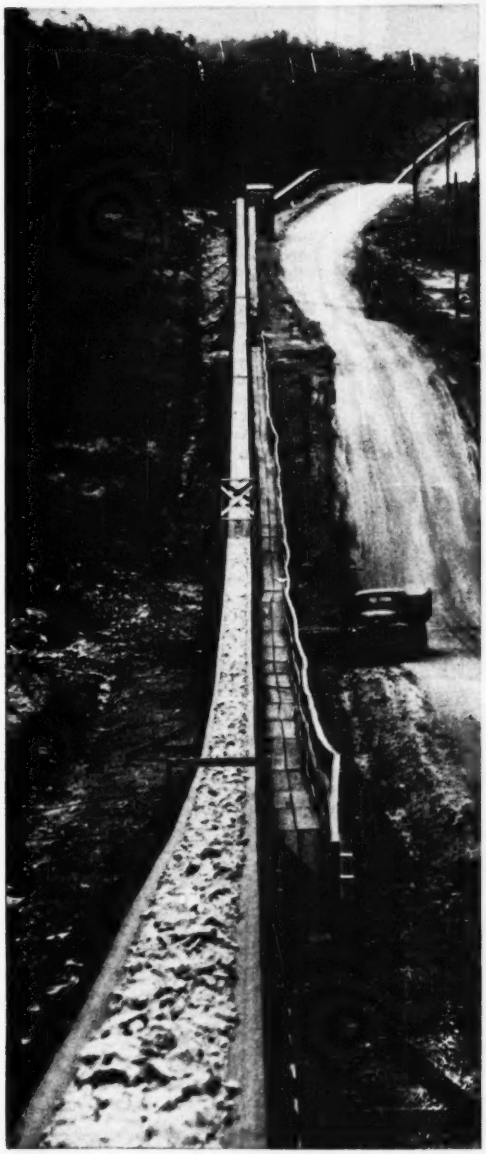
Sterling WHEELBARROWS

HIGH-SPEED SPRAY GUN—Two new metallizing guns are announced for machine element work and for corrosion-protection coatings. They are made to develop the highest spraying speeds yet available in guns designed for hand-held operations. They incorporate a patented jet-principle in the gas head which automatically compensates for variations in gas pressure as high as 10 lb. The Metco Type 4E gun is designed to spray all wires from 20 gage to ⅛ in. in any metal at speeds up to 40% faster than previous models. Type 5E is the first gun designed for high-speed spraying of the softer metals, such as zinc and aluminum, for protection of equipment and structures against corrosion for periods ranging from 20 to 30 yr.—**Metallizing Engineering Co., Inc., 38-14 30th St., Long Island City 1, N. Y.**



BUTT TEMPLET FOR HANGING DOORS—Model 5006 butt templet, designed for use with a Porter Cable router, can eliminate hours of tedious labor involved in cutting hinge butts for doors and jambs. During recent tests butts were mortised in 1½ min with this new templet. The templet is adjustable for 2½- to 5½-in. hinges and also adjustable for two or three butts on either doors or jambs. After it is adjusted for size of the door and size of the hinge to be mounted, the templet is locked in position on the door or jamb. Then a few strokes of the router produces a clean, neat mortise, except for the corners which are taken care of with a special corner chisel. Weighing less than 4 lb, the templet is 1¾ in. high, 4 in. wide and 63 in. long, when fully extended. It collapses to fit into a metal carrying case.—**Porter-Cable Machine Co., Dept. PR-2, Syracuse, N. Y.**

Mountain Moved 7 Miles @ 4½¢ per Ton-Mile



More than 4½ million tons of aggregates were used in building the Bull Shoals Dam. To obtain the rock, a mountain was leveled 7 miles away. The material moved those 7 hilly miles over Hewitt-Robins idlers *for only 4½¢ per ton-mile.*

Flippen Materials Co. acted wisely in selecting belt conveyors. They saved $560,000 on purchase *and installation* vs. a fleet of trucks, a 7-mile highway and incidentals. They saved another $375,000 in 2½ years on man-hours—a total saving of $935,000 without considering the economy of electric power over gasoline and oil. Total replacement and repair expense for Belt Conveyor Idlers was less than $2,500. Compare that with the expense of keeping 30 twenty-ton trucks (and their tires) rolling 2½ years!

Belt Conveyors offer you numerous other substantial benefits. For installation, operation and maintenance, you need a primitive dirt road—not a paved highway. You cut across grades—no winding for miles around them. Rivers, ravines and roads can be spanned with bridges *made of wood*. When tunneling is inevitable, a simple hole is adequate.

Hewitt-Robins offers three types of Belt Conveyors—engineered, sectional and low sectional—able to meet every construction-project need.

Before you bid on another highway or dam job, consider belt transportation. Send us the details, including topographical maps, for an unbiased analysis. We will tell you—honestly and factually—whether belt conveyors will save you time, trouble and money. Address Contractors' Service Dept., Robins Conveyors Division, Hewitt-Robins Inc., 270 Passaic Ave., Passaic, N.J.

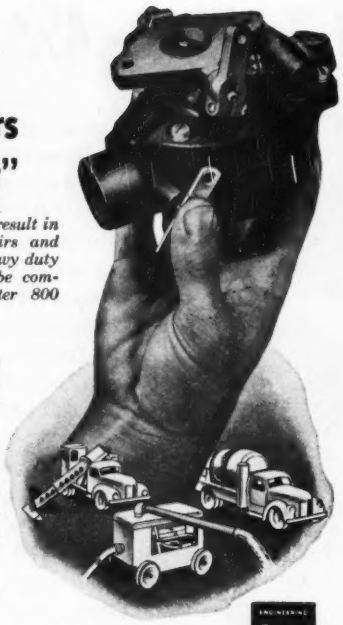
Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation.

HEWITT-ROBINS BELT CONVEYORS

HEWITT-ROBINS (HR) **INCORPORATED**

BELT CONVEYORS (*belting and machinery*) • BELT AND BUCKET ELEVATORS • CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS • FOUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS • RUBBERLOKT ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS • TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

You'll Save on Gasoline...Repairs ...and "Time Out"



Engineers say: *"Worn carbureters result in gasoline waste, expensive repairs and poor engine performance. On heavy duty equipment, carbureters should be completely rebuilt or replaced after 800 work hours."*

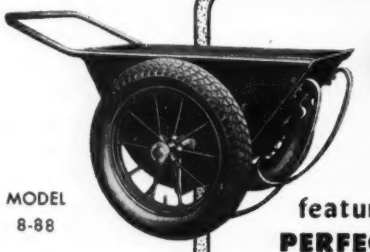
TAKE this tip from men who know—and make your replacements with Marvel-Schebler Carbureters.

Because of their rugged strength, unusual dependability and economy of operation, Marvel-Schebler Carbureters are original equipment on many industrial engines and tractors.

MARVEL-SCHEBLER PRODUCTS DIV.
Borg-Warner Corp., Decatur, Ill.

MARVEL-SCHEBLER
CARBURETERS

B-W ENGINEERING PRODUCT



MODEL 8-88

JACKMANCO
REG. U. S. PAT.

CONCRETE CARTS
feature
PERFECT BALANCE and ROCKER DUMP

All models are easy wheeling and turning. Many models to choose from. Available at your local dealer.

These blue beauties are made with pneumatic tired wheels. Drop axle.

Bodies are flanged, riveted and welded to prevent opening at seams. Capacity from 6½ to 9 cu. ft.

Ask for Jackmanco and be sure.

Superior Products Since 1876

JACKSON MANUFACTURING CO.
HARRISBURG • PENNSYLVANIA

ROCK SALT SPREADER — The worker in the photo above is shown dumping bags of rock salt into a new shaker designed to provide a controlled spread of coarse salt for snow and ice removal. It hooks over the tail gate of any truck and may be attached, removed or changed from one truck to another without alterations, use of bolts or other holding devices. Spreader holds 250 lb of material, has adjustable holes in the bottom through which the salt pours out on to a highway and a regulating handle to control the rate of flow through the blades. It should be hung as far as possible to the left side of the tailgate so that it overhangs the center line of the road to distribute rock salt equally on both sides of the line. Spreading truck needs to make only one trip down a highway to cover both lanes during an average snow or ice storm. When set to one-half the maximum capacity of the openings, the spreader will apply coarse rock salt at a rate of 300 to 400 lb per mi of 20-ft pavement at a truck speed of approximately 15 mph. Density of application may be regulated either by changing the size of the openings or by increasing or decreasing speed of the truck.—**International Salt Co., Inc., Scranton 2, Pa.**

Sorry, Wrong Long

IN OUR SEPTEMBER ISSUE, in an article on erection of steel with a skid-mounted crane for a 17-story apartment in Atlanta, we listed the Long Construction Co., Kansas City, as general contractor for the project. Well, we were long on Longs but short on accuracy. That was the wrong Long. Right Long is Long Construction Co., a division of Long Corp., with principal office in Charleston, S. C., and branches in Atlanta and San Juan, Puerto Rico.

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

PIPE CLEANING—"Mobilized pipe cleaning—anywhere—any time" is the title of a 6-p folder which describes services of a pipe-cleaning contractor. The secret is ready mobility of equipment. Booklet describes how manholes are spotted on a scheduled route. If manholes are "lost" they are located with magnetic finders. Straight-rod men take over, pushing a rotating rod through to the next manhole, opening the sewer, and then make a pull-back connection for bucket machine cable. Bucket machine crews then take over, cleaning the unseen sewer mains and bringing up silt and sludge to be hauled away.—**Ace Pipe Cleaning Contractors, Inc., Kansas City, Mo.**

TRANSPORTATION — "Industrial Transportation" is the title of a folder which provides an acquaintance with the complete scope of Easton experience and facilities. It includes pictures of off-highway trailers and truck bodies, mine and quarry cars, rocker dumps, industrial trucks, heavy-duty intraplant trailers and heavy-duty industrial cars.—**Easton Car & Construction Co., Easton, Pa.**

DIESEL ENGINES—"What Do G.M. Diesels Do" is the title of a booklet which describes the many uses diesel engines fulfill in our modern economy. This novel booklet is written in rhyme and illustrated by drawings of locomotives, buses, boats, power shovels, sawmills, and many other pieces of essential equipment commonly powered by diesel engines. Copies are available to individuals, schools, libraries, reception rooms. —**Detroit Diesel Engine Div. General Motors Corp., Detroit 28, Mich.**

FLAT-BASE PIPE—Here is an illustrated brochure describing the company's various sizes and shapes of reinforced concrete flat-base pipe. The pipe is used upright or inverted for culverts, pedestrian underpasses, cattle passes, utility galleries and manholes. Produced ready for use on the job without modifications, the flat-base sections can be laid in new fills or jacked through old construction. Conveniently located lifting holes facilitate handling and positioning. Joints are all tongue-and-groove, watertight, with rubber gaskets. Manufactured in sections 46x46 to 97x97 by—**Universal Concrete Pipe Co., 297 S. High St., Columbus, Ohio.**

CLEANS TRACTOR IN 1 TO 3 HOURS *with* MALSBARY 500

SUPERHEATED SOLUTIONS...
pressures to 400 lbs., blast dirt and cleaning costs.

Peterson Tractor & Equipment Co., San Leandro, California, use MALSBARY high pressure cleaners exclusively. They clean tractors for painting and overhaul in 1 to 3 hours—a job that requires 4 to 8 hours with limited lower pressures developed by conventional steam cleaners.

You save up to 40% of mechanics' time because you eliminate grease wiping and dirt scraping on surfaces cleaned the MALSBARY way.

CHECK THESE 4 MONEY-SAVING FEATURES

✓ **EXCLUSIVE PATENTED PUMPING SYSTEM** replaces steam as source of working pressure on MALSBARY high pressure Models 250, 300 and 500. Cleaning efficiency is not limited to steam formed in the coils.

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HONING MACHINES — This 16-pager is not a mere bulletin describing honing machinery, but is rather an actual treatise on honing. It describes fully the art of precision honing of internal cylinders. Several models are shown with complete specifications for each. Other sections are concerned with stones, spot insertion and removal, speeds and coolants.—**C. Allen Fulmer Co., 1211 Fist National Bank Bldg., Cincinnati 2, Ohio**

SNOWPLOWS — The complete line of truck-mounted snow plows manufactured by the Baker Mfg. Co. is described in Bulletin No. 1003. The bulletin describes the Baker V-Type, Reversible Tripping Blade, and One-Way Tripping Blade Plows in a complete range of sizes. The V-type and One-Way Trip Blades are produced in sizes for trucks of 1½ to 2 tons, 2½ to 3½ tons, 3½ to 5 tons, and 5 tons and up. Reversible trip blades are made for 1½ to 2 tons, medium capacity and heavy-duty trucks. Two types of plow mountings are described—underslung type which attaches to side channels and axles of trucks, and front-end push type which are mounted to the front bumper and front end of a truck frame. The lift and push frames have a hand-operated hydraulic lift pump mounted conveniently inside the cab. Full and semi-flare plates are available to increase height and plowing capacity of blade-type plows. The V-type and One-Way Plows have spring deflectors for increased windshield protection.—**The Baker Mfg. Co., Springfield, Ill.**

PAVING PRODUCTS—The interesting fact brought out in this 8-p booklet is that all paving products can be purchased and shipped from a single source. The company offers asphalt, corkfill and fiber expansion joints, center strips, dummy joints, concrete curing compounds, subgrade paper, base plates, rubber asphalt joint seal, sewer joint compounds, and road-marking paints. The three types of joints are pictured with general descriptions, physical properties, and standard specifications, as well as sizes, thickness, and installation instructions.—**W. R. Meadows, Inc., Elgin, Ill.**

PHOSPHATE COATINGS—Anchorite 100 is a phosphatizing compound that changes the surface of steel, iron, zinc and cadmium parts into an inert phosphate coating. This new surface provides an excellent base for organic coatings—a base that protects the metal against all types of atmospheric and chemical corrosion. Printed in two colors, the 8-p booklet describes in detail common causes of paint failure and how they can be prevented. It points out that the product meets U.S. Army specifications.—**Octagon Process Inc., 15 Bank St., Staten Island 1, N.Y.**

PLYWOOD-STEEL FORMS — Atlas Compo forms are completely assembled, square-edge units consisting of a welded steel frame with a plywood base. They are ready for use as soon as they reach the job. A 4-p folder describes their make-up, sizes, weight. The plywood panels have their entire perimeter protected by a steel angle. Due to their unique design, they are light in weight and should have extremely long life. Illustrations show how one single panel can be removed without disturbing adjoining forms. This is especially desirable when boxes, sleeves, pipes are to be installed.—**Irvington Form and Tank Corp., Atlas Compo Form Div., 20 Vesey St., New York 7, N.Y.**

PLANNED LUBRICATION—A two-color, 20-p bulletin gives full details on 7 Keystone specialized lubricants that cover the majority of plant requirements, with a minimum of different types and densities. Information includes: lubricant characteristics, benefits, uses, densities, specifications, and container sizes. Products covered are lubricants for ball and roller bearings, plain and ring bearings, open gears, enclosed gears, speed reducers, and oils for cleaning, loosening and penetrating. Bulletin BK-19 can be obtained from—**Keystone Lubricating Co., 21st, Clearfield and Lippincott Sts., Philadelphia 32, Pa.**

REFRACTORY COATINGS — Bulletin cites many product tests for CERA-KOTE, a super refractory coating applicable by brush or spray. Tests include those used in industrial heat-treating furnaces, kilns, ovens, boilers, where the coating has increased refractory life by as much as 30%. A partial check list of users and uses of the product are included in the folder, noting application to both brick and plastic refractories. It describes how the product serves as a preventive against slag penetration, abrasive wear, flame erosion, corrosive gases, molten metal, and thermal shock. Write on your company letterhead to—**Williston & Co., Peoples Bank Bldg., Delta, Ohio.**

MASONRY UNITS — Waylite is a lightweight cellular aggregate, refined and expanded by a process of agitating and rapid cooling. This process expands and fills the material with minute air cells or bubbles, completely sealed. These air cells are the active insulation and lightweight principle in all Waylite aggregates. This 16-p folder is concerned essentially with masonry units including interior finishes, masonry walls, floor and ceiling construction, as well as back-up walls and partitions. In addition, charts and information are provided showing Waylite aggregate for plain and reinforced concrete; also for roof and floor fills.—**The Waylite Co., 105 W. Madison St., Chicago 2, Ill.**

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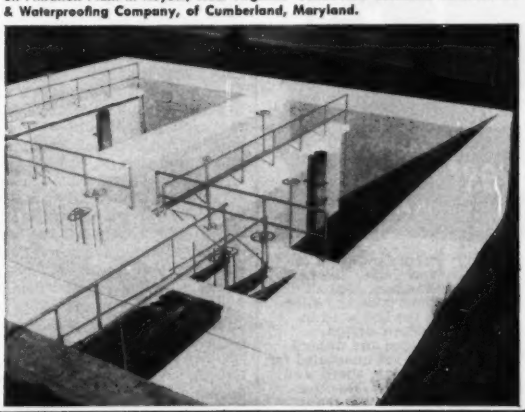

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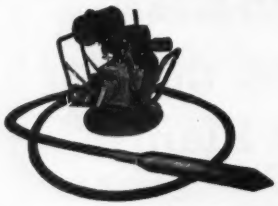

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SWISS PATTERN FILE—Here is an 8-p brochure which features diemaker files, machine files, and needle and riffler files; the various types are illustrated and fully described. Catalog, No. 51-821 has a side and end view of each file and complete information on sizes and prices.—**The DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.**

AIR CYLINDERS — Twenty-eight different models of air cylinders, each in nine bore diameters, are illustrated and described in this new Catalog No. 55. The three-color book lists every standard air cylinder offered in the industry. Working drawings and specifications are furnished for each model and size cylinder, both standard and cushion types, single and double end-rods, internal and external threads. Information relative to a particular model is all shown on one page, facilitating easier layout of circuits by any engineer. Cylinder mountings described are Rabbet, Foot, Trunnion, Center Line, Blind End Flange, Rod End Flange, and Clevis. These cylinders are recommended for air pressures of 150 psi maximum, and oil pressure of 300 psi maximum.—**Rivett Lathe & Grinder, Inc., Brighton 35, Boston, Mass.**

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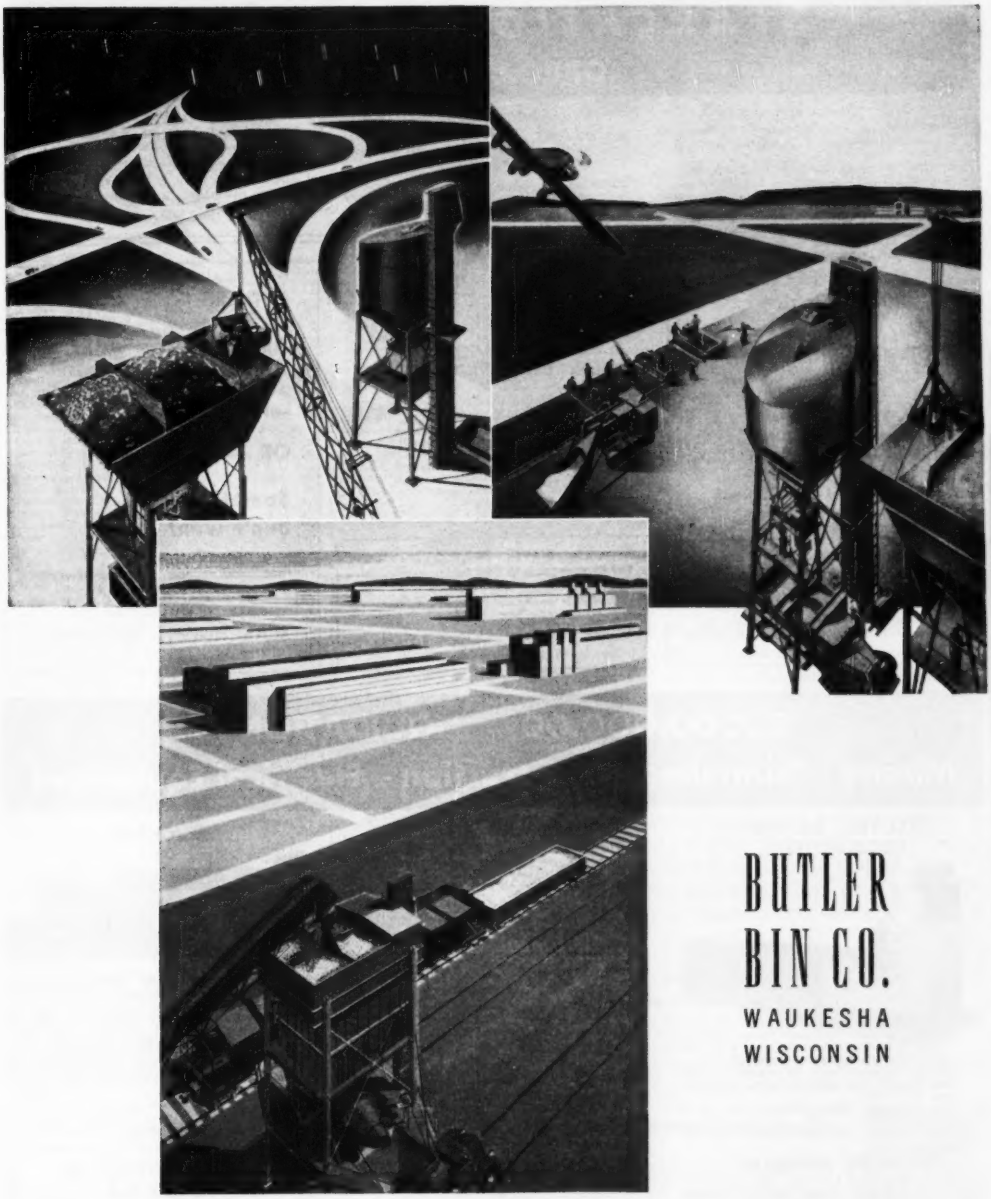

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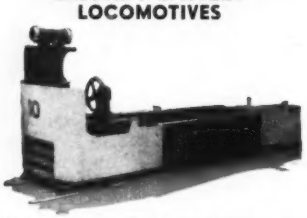

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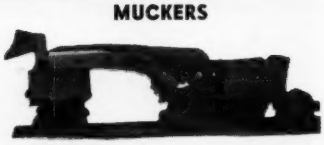

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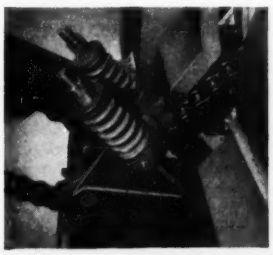
CHECK THESE FEATURES

- √ Fully Convertible
- √ Long, Wide Crawlers
- √ Alloy Cast Bases
- √ Tandem Drums
- √ Power Dipper Trip
- √ High Line Speeds
- √ Wide Vision Cabs
- √ Pin-Connected Boom



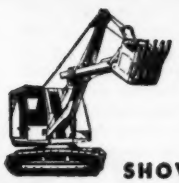
Automatic crowd chain adjuster.

the lifetime cost of a BAY CITY SHOVEL . . . on the basis of yards and tons handled . . . *is amazingly low*

While it is true that BAY CITY equipment has always been moderately priced, it's the low yearly lifetime cost that pays off. Scores of BAY CITY machines have records of 20 to 25 years or more on the job. No single factor makes BAY CITY shovels and cranes so long-wearing—so long-lasting. It is a combination of heavy-duty design and construction features that contribute to the extremely long life of BAY CITY equipment.

The BAY CITY Balanced Design plus the many operating and maintenance advantages have been engineered with bigger value and dependable performance. For stability the long, wide crawlers. For low center of gravity the one-piece heat-treated alloy-steel cast bases. For alignment the mounting of engine and all machinery on a full length base. Get complete information from your nearest BAY CITY dealer—write today for catalog.

BAY CITY SHOVELS, INC. **BAY CITY, MICH.**



BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

Methods Memo . . .

OUR CURIOSITY was aroused recently during a visit to Columbia, S. C., in seeing concrete being distributed on the new State Highway Department office building with the old familiar high wood towers and long chutes. We thought this pouring system passed out 20 yr ago with the swing from wet to dry concrete. But the contractor, M. B. Kahn Construction Co., told us that air-entrained cement made chuting possible with 4-in. slump concrete. The mixture coming off the end of 70 ft of chuting looked all right, too, and Kahn said it tests around 5,000 lb in 28 days against spec requirements of 3,750 lb. Is it possible that introduction of air-entrained cement to building construction will bring about a revival of the once-popular tower and chute concrete distribution system?

SORRY TO REPORT, however, that our enthusiasm for this project rapidly waned when we noticed some appalling lack of safety consideration. We noticed the stone work scaffolding—fine steel units, they were, too—propped up on precarious stacks of hollow tile and brickbats. How can you expect labor to work efficiently on such precarious underpinning? Ladders were thrown together from scrap form lumber, with spliced rails, irregular rungs of varying length and width. The refuse chute was tacked up with scantlings—so formidable in appearance that workmen gave it a wide berth, and took several extra minutes to walk around it, well in the clear. How in the world can a contractor ever hope to get anything out of his men unless he is willing to provide them with at least the minimum essentials of safe working conditions?

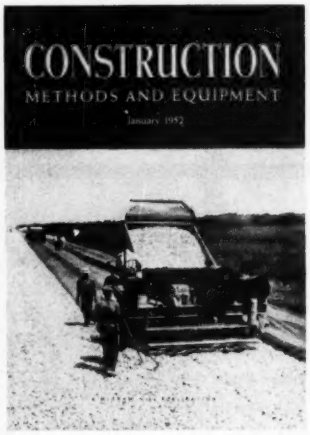
YOU HIGHWAY CONTRACTORS may have to begin thinking seriously about what you can do to assist in promoting safety on our roads. With the advent of limited-access expressways, where sustained high speeds are common, has come a new menace: the high-speed collision from the rear. The first fatal accident on the New Jersey Turnpike snuffed out instantly the lives of five youthful Marines homeward-bound on Christmas leave. Their late-model Chevrolet plowed squarely into the rear of a heavy tractor-trailer at what State Police called "a very great speed"—at 3:55 a.m. This is the type of accident that should never happen. Although all these super-roads are designed with every safety factor possible, we may have to fall in step with educational efforts of the National Safety Council, law enforcement agencies, highway officials and automobile makers to help keep every driver alert on the open road. The Turnpike was open for 43 days and handled 464,241 vehicles before this tragic accident.

CONSTRUCTION EQUIPMENT BUILDERS make it a habit to meet every challenge to their ingenuity. Recently, in 16 working days, Caterpillar personnel developed and assembled two units known as the Caterpillar Military D5 Tractor for the Army. It is a lightweight model, weighing less than 8 tons, designed for air transport. Basically it combines a D6 engine and D4 frame, but includes parts designed to meet special weight specifications. Similar machines from other tractor manufacturers also are undergoing Army tests.

IDLE CONSTRUCTION EQUIPMENT often can be put to profitable use during slack periods if a contractor uses his head to look around for fresh fields. One such is the growing practice of building farm ponds to water stock, for fire protection and recreational purposes. Scooping out a pond area and doing the necessary grading and dam building normally can be done by equipment which almost every excavation contractor has. Local agricultural services generally cooperate willingly in design and surveys.

IT'S A GOOD IDEA for contractors not to relax in their efforts to line up new business for the days ahead. Although there are shortages of materials, and although some now may have more work than they can handle, there is the possibility of the economic wind blowing from another direction in the not-so-distant future. At least one pacesetter among construction outfits is suggesting to possible future clients that they would do well to have designs studied now and be in position to get work under way quickly once the present situation eases.

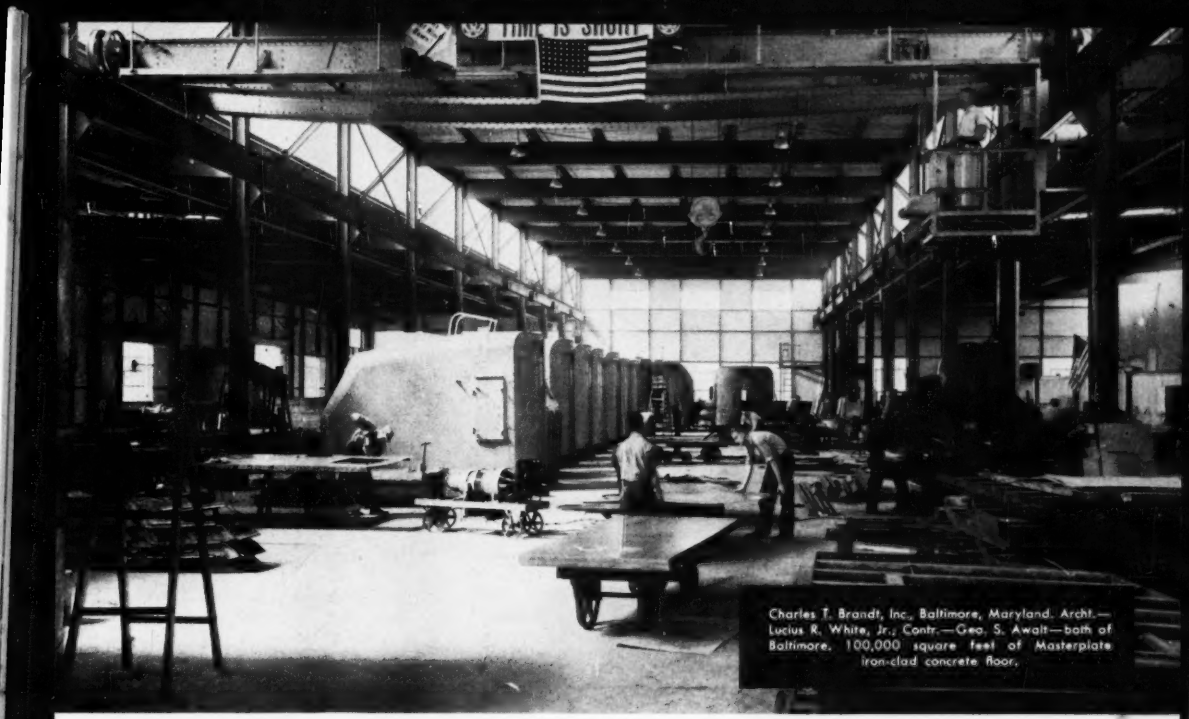
WHITE ELEPHANT DWELLINGS—the old, large houses so common in many towns, and usually a financial drain on their owners—may get a new lease on life. It has been suggested by the Tile Council of America that contractors try to enlist owners of such houses in a plan to convert the large buildings into smaller living units to attract more families and receive some income. It is estimated that about 23,000,000 of our older homes could become income-producing, principally through the addition of bathrooms and kitchens. Military services and the Office of Rent Stabilization are giving the plan full support. For more information, contact Roy W. Schweiker, Chairman, Tile Council of America, 10 East 40th St., New York 16, N. Y.



On the Cover . . .

Rolling down the New Jersey Turnpike, an Adnun paver spreads crushed stone for the first of two layers of penetration macadam base that will be topped by three layers of asphaltic concrete surfacing. This lift is 4½ in. of graded 3-in.-minus stone. Next lift, also spread by Adnuns, will be 3 in. of 2-in. stone. Both are put down in two 12-ft widths for each roadway and are penetrated with 1.75 gal per sq yd of 100-120 asphalt, then choked with ¾-in. stone.

S. J. Groves & Sons Co., Minneapolis, spread stone for its 35 mi of Turnpike with six of these Adnun pavers. As spreaders, the machines are fitted with an unheated screed, and the usual twin steel roller-wheels at the rear are replaced by two sets of pneumatic-tired wheels for better traction on the dry stone. Laying the material accurately and uniformly, two of the Adnuns together placed 4,000 tons of stone in one 10-hr day.



Charles T. Brandt, Inc., Baltimore, Maryland. Archt.—Lucius R. White, Jr.; Contr.—Geo. S. Awalt—both of Baltimore. 100,000 square feet of Masterplate iron-clad concrete floor.

The Lowest Cost Floor You Can Buy—A MASTERPLATE "Iron-Clad" Concrete Floor

OTHER MASTER BUILDERS PRODUCTS IN WHICH CEMENT DISPERSION IS EMPLOYED

EMBECO...
For non-shrink grouting and re-integration.

MASTERPLATE..
For "iron-clad" concrete—industry's toughest floor. Non-colored and 11 colors.

MASTERTEX...
Cement-base paint of low permeability for protecting and decorating exterior and interior surfaces of concrete and masonry.

OMICRON MORTARPROOFING..
For tight brick walls. Provides good workability with 15-20% less water, correct water retentivity. Contains stearate.

During the past twenty years, many million square feet of "iron-clad" Masterplate floors have been installed in such plants as Charles T. Brandt, Inc., because their longer life — 4-6 times greater wear resistance than a plain concrete floor — and their low original cost make them the most economical all-purpose floor.

In addition to its low annual cost, the Masterplate iron armored concrete floor has several important *service* advantages. Check these features of the Masterplate Floor against *your* requirements:

- Wear Resistant
- Spark Resistant*
- Static Disseminating*
- Non-Slip Finish
- Non-Dusting
- Easy-To-Clean
- Corrosion Resistant
- Built-In-Color — Non-Colored and 11 Attractive Colors
- Maintenance Economy

*spark safe floors with 1.0 to 1.25 lbs. Masterplate per square foot of floor

These advantages of the Masterplate Floor result from the *thick* iron-concrete armorplate produced by embedding specially processed, size-graded iron particles, combined with Master Builders' cement dispersing agent, in the *surface* of concrete while still in a plastic condition.

Ask for full information and pictorial directions on Masterplate for new floors and resurfacing old concrete floors; also free floor survey.

the MASTER BUILDERS Co

CLEVELAND 3, OHIO — Subsidiary of American-Marietta Company — TORONTO, ONTARIO

HERE'S WHAT WE PUT *INTO* A ROCK DRILL ...SO YOU CAN GET MORE *OUT* OF IT!

Combination Backhead for blast rod, air tube or water tube operation greatly reduces cost of change-over parts. Air-operated automatic water valve is optional on same backhead.

Jet Valve is instantaneous, positive-acting, end-seating. Thrown by a jet of air, it provides precise timing. Increased piston hammer velocity results in high drilling speed, low air consumption, strong rotation and easy holding.

Integral Cylinder. All hammer bores are ground in line at one operation, allowing piston hammer to run in true alignment. Replaceable bronze cylinder bushing maintains the front cushion.

Resilient Retainer. Yoke-type, held in replaceable hardened steel bushings and spring-cushioned to dampen vibrations when pulling drill rods. Easily opened and closed, can't wear the chuck housing, and has positive lock-on nuts.

Four-Pawl Rotation. Four reversible pawls give maximum service at four rotation speeds — extra fast, fast, slow, extra slow.

Independent Blow Control changes from drill to blow with ease. Full line pressure available for emergency blowing. Large diameter air tube assures strong, constant blow. Side outlet exhaust is possible with optional blow valve.

Three-Piece Chuck. Chuck, sleeve and nut. Replaceable bronze chuck nut held in a steel sleeve checks piston flute wear.

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Have Everything You Need For Hard, Fast, Money-Saving Drilling

With every detail designed to make air do more work, Blue Brute Rock Drills combine the ruggedest construction with the easy handling that goes over big with operators. The WS-55, illustrated, is right for average jobs. For lighter work, use the WS-45 — for heavy duty, the WS-30.

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WB-34 Paving Breaker
Hardest-hitting, easiest handling breaker in the 35-lb. class. Ideal where the operator has to lift the tool frequently in guiding its work.

W-14 Clay Digger
Developed in the field by men with practical experience in clay, and thoroughly proved by long, rigorous job-testing.

W-8 Backfill Tamper
Medium weight, with simple horseshoe valve and ample oil reservoir. A good "walker" that does a finished backfill job, ready for immediate paving.

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